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NEW ENGLAND COASTAL ZONE  
MANAGEMENT CONFERENCE

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PROCEEDINGS

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PROCEEDINGS

THE NEW ENGLAND COASTAL ZONE MANAGEMENT CONFERENCE

2<sup>a</sup>/ April 28-29, 1970

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Robert H. Forste, Editor

The New England Center for Continuing Education  
Durham, New Hampshire  
December, 1970

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## PREFACE

Many people view the extensive coastline of New England as the region's greatest natural resource, providing access to the sea--the source of many products and services in the past, and a resource that can be widely explored and wisely exploited in the future.

Conflicting demands on the resources of the coastal zone are increasing at an extremely rapid rate. Conversely, the opportunity to make sound decisions and plan for the development of our coastal zone resources is rapidly diminishing. The numerous competitive users of the coastal zone speak loudly and clearly to their own interests, be it sand and gravel dredging, pleasure boating, land fill for industrial and urban development, sewage disposal, and the host of other uses. It is time for all of the people of New England who have an interest in and are concerned about their coastal zone to speak up.

To encourage citizen participation, the first New England Regional Coastal Zone Management Conference was held in April, 1970. The sponsors of the conference felt that every effort must be made to insure that the further development of our coastal areas proceed in an orderly and reasoned manner: development will have to be undertaken on such a basis if the best economic, biological, and esthetic use is to be made of the coastal resources.

The papers that follow provide the flavor and deliberations of the April conference that addressed these issues. It is hoped that these conference proceedings will promote a cooperative regional effort and lead to a regional plan that will serve as a model to the rest of the nation.

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## INSTITUTIONAL BARRIERS AND THE COASTAL ZONE

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When I left Washington, the dogwood were blooming, the cherry trees had just concluded their annual service to visitors, and Coastal Zone Management lay quietly in the doldrums of Spring days and legislative introspection.

Having been asked to address a few remarks to this distinguished audience today, I thought it only fair to speak for a while about why this top priority problem seems to be receiving less than the desired degree of attention. I am sure that some of you may be curious.

In the development of these remarks, let me assume that we are all aware of the importance of effective coastal zone utilization, and that we all know the substantive issues. This will permit me to pass over most of the history, and address myself to the procedural questions as quickly as possible.

I would like to begin by citing one important piece of "legislative history," because it so succinctly states what I perceive to be the proper theme of this meeting. These words are taken from the opening paragraphs of the coastal zone management chapter of the report to the Commission on Marine Science, Engineering, and Resources:

"Rapidly intensifying use of coastal areas has outrun the capabilities of local governments to plan their orderly development to resolve conflicts. The division of responsibilities among the several levels of government is unclear, and the knowledge and procedures for formulating sound decisions are lacking.

"The key to a more effective use of our coastland is the introduction of a management system permitting conscious and informed choices among development alternatives.....The benefits and the problems of achieving rational management are apparent. The present Federal, State, and local machinery is inadequate. Something must be done."

That was the challenge, and we are only now beginning to face up to the difficult economic, political and practical decisions relating to how and by whom the job is to be done.

I want to share some thoughts with you about how we seek to establish such machinery from a national viewpoint. I think this is appropriate for a meeting of this nature, because before the States realistically can be expected to provide sophisticated planning to manage their land/sea interface, we are going to have to put our Federal house in order and provide the level of institutional and financial support required to assure successful planning.

The major thrust on the Federal level has been directed at creating a matching-grant program whereby the States can conduct balanced planning within broad general guidelines that would assure uniformity where national conformity is in the public interest. I suspect that you have kept in touch with this approach. Yet, I am sure that all of us in this room are becoming somewhat discomforted by a growing awareness that efforts to create a national focus on coastal zones are not proceeding at a very gratifying rate. In plain language, we seem to be bogged down. There are reasons for this, and it is those reasons I wish to propound today for your consideration.

The problem is not one of conceptualization. We have a reasonable grasp of the facts that are needed to promote a matching-grant type of program. The Stratton Commission, through its excellent panel chaired by John Knauss, generated a most comprehensive and usable study, and the report of that Commission has been available to the Congress for more than 15 months.

Nor is the problem a lack of visible support. In October, 1969 the Vice President announced that the President has selected coastal zone management as one of the five programs for action in marine sciences, and he further announced the submission of legislation that, in substance, resembled the conclusions of the Stratton Commission. The Interior Department was named as the "lead agency."

The bill of the Administration was referred by Executive Communication to the Senate and the House early in December 1969. The terms of the bill proposed to amend Section 5(g) of the Federal Water Pollution Control Act to give the Secretary of the Interior responsibility for administering a joint Federal-State program. This bill was referred to the House Public Works Committee for action.

The Senate also has the Administration's proposal, and in addition, a second bill introduced earlier by Senator Magnuson. Both bills are in hearing before the Subcommittee on Oceanography of the Senate Commerce Committee, and things seem to be moving smoothly.

On the House side, however, the picture is more complex. In addition to the bill before the Public Works Committee, there are three bills pending before the Committee on Merchant Marine and Fisheries. These bills evolved from a two-day Congressional conference sponsored and conducted by Congressman Alton Lennon, Chairman of the House Subcommittee on Oceanography. This somewhat unorthodox approach to the generation of legislation was designed to receive a needed input from the representatives of the 30 coastal and Great Lakes states in attendance. Subsequent to the October 1969 meeting, Chairman Lennon and ranking minority member, Charles A. Mosher, jointly prepared and introduced H.R. 14730, H.R. 14731, and H.R. 15099. These bills differed in substance only with respect to the agency or department that would in each case be assigned lead responsibility for administering Federal grants.

With clear Executive support and Congressional interest, one might readily wonder why no legislation has yet reached the floor.

I evaluate the problem to be institutional in nature, and it is unfortunately not of the self-liquidating variety. It must, therefore, be dealt with or avoided before the proposed management program becomes fact. While there are efforts in this direction that I will mention later, there are some symptoms that are disconcerting.

For example, it is a matter of record that since referral of the Administration's bill in December, the Public Works Committee has held only one hearing. This hearing was held to take the testimony of Secretary Hickle and other representatives of the Interior Department, which would be the beneficiary of the Administration's proposal.



I do not wish to be accused of playing favorites, so I must in all fairness say that it is also a matter of public record that the Committee on Merchant Marine and Fisheries has held no hearings since its October conference, and none are scheduled at the present time. These are the signs that are not particularly encouraging and even less so when one considers that in this election year there undoubtedly will be pressure for early adjournment. Time is running out.

These signs suggest that in our haste to create substantive conclusions, we may have created procedural problems of some magnitude. We may have put the cart before the horse. Obviously, a matching grant program of some sort is agreeable. It seems, however, that we have not been able to come to grips with the fact that a management program of this magnitude is fraught with institutional overtones of considerable significance. Until we learn to identify and deal with these "organizational embolisms" the program on the Federal level will continue to hang in the balance.

The very vastness of the program calls into play several Federal agencies and as many, or more, Committees of Congress. We simply must learn to sort out the various components involved; identify their special interests; and prepare to satisfy them by serving those interests or make them irrelevant to the solutions.

Achieving adequate coordination among fractionated levels and sub-levels of government is always a touchy issue, whether you are talking about the Executive Branch or the Congress. Where the need is to reorganize for a limited purpose, the problem is immensely simplified. If the issue is narrow enough, it may well be that no legislation is required. But the coastal zone problem is of such breadth that it does call for special authorizing legislation, and like it or not, we are faced with coming to grips with all of the many ramifications that fact conjurs up.

I would like to touch on just two of those ramifications because I believe they are having a direct effect on the legislation now before the House.

The first ramification is that there are too many agencies and committees who are, or could be, affected by the enactment of sweeping coastal zone management legislation. As always in such cases, the spectre of jurisdictional dispute appears. The Congress, like anyone else, works within certain regulatory limitations. In the case of the House, these limitations and guidelines can be found in a document entitled Constitution, Jefferson's Manual, and Rules of the House of Representatives. This document contains the outlines of committee oversight. These rules were constructed a long time before environment became a popular issue, and structured to meet the needs of that day. An examination of the rules reveals that there is more than one committee having a legitimate interest in coastal zone legislation.

The Committee on Merchant Marine and Fisheries, due to its work in fisheries, wildlife, transportation, the Coast Guard, and oceanography is directly concerned. Just as clearly, however, the rule assigning legislative oversight to the Public Works Committee for oil pollution and construction affecting navigation gives it an equally strong claim. Other identifiable interests can be located in the Committees on Armed Services, Agriculture, Interior and Insular Affairs, and perhaps more.

This overlapping of jurisdiction, plus the interplays between affected Executive departments and agencies, constitutes the kind of institutional problems for which we seek rapid solutions.

The second ramification is complication of the coastal zone issue by the presence of various recommendations for creating larger and more comprehensive spheres of Federal influence. There is a prevailing feeling in Washington that coastal zone management may appropriately fall within the scope of a larger oceanic or environmental organization than presently exists.

The Stratton Commission made it clear that zone management responsibilities should be undertaken by a new, independent agency for oceanic and atmospheric affairs. In one respect or another, coastal zone problems have never since been entirely divorced from this broader organizational question. The so-called "Ash Council," appointed by the President to examine the entire question of Federal reorganization is now considering some recommendations in this area. Naturally, since the report is not in, there are only speculations as to what the precise framework should be. At the very least, however, the Ash Council is involved in questions of ocean management, resource development, and environmental quality. The knowledge that the Ash Council and the Congress itself are actively studying new organizations serves, in my opinion, to create an atmosphere of caution and hesitation. There is the vague feeling that the management problem should be deferred until we are certain that it has a proper Federal home. The combination of this apprehension with committee jurisdictional problems has operated to cause the pause that now exists.

Let me sum up by making a few positive observations. I do not believe that the hesitancy that I have referred to is a necessary adjunct to the prospect of substantial reorganization. It can be overcome by some confident assurances and by a little activism from interested parties. The fact of the matter is that even if Congress were to decide today to place coastal zone management within the responsibilities of the Interior Department, it is likely that the organizational problems would be solved before legislation ever reached the floor. The Ash Council is due to report to the President momentarily.

The jurisdictional question is much more difficult, particularly in the House. On the Senate side, the rules permit one Committee to refer legislation to another with the understanding that it will be returned for review. Hence, the Senate Public Works Committee has agreed to hearings by the Commerce Committee on the understanding that any legislation resulting therefrom will be re-referred to Public Works. No corresponding mechanism is available in the House. It remains, therefore, for the two Committees primarily involved at the moment to handle the problem. This means that they both must be urged to press ahead, and let the jurisdictional chips fall where they may. In the process, unfortunately, there is the risk that the bill's merits could be somewhat obscured.

Perhaps a solution to this difficult quandry could be found in H.J. Res. 1117, now pending before the House Rules Committee. This proposal, long advocated by Congressman John Dingell, and put together by a task force of the House leadership, would establish a Joint Congressional Committee on Environment and Technology, consisting of 19 Members of the Senate and 21 Members of the House. All the affected Committees would be represented. While this proposed new Committee would have no power to report legislation to the floor, it would be authorized to take cognizance of programs such as coastal zone management, hold hearings, and be responsible for selecting the proper legislative committee for action.

Clearly, a major "in-house" reorganization of Congressional committees may some day be in order. But until such time it would seem a justified conclusion that the proposed joint committee would be an effective device in helping to curb disputes. There is ample precedent in the House to support this conclusion. I believe that this proposal deserves your active support.

The sum and substance of the message I bring you is exactly that articulated by the Stratton Commission: "Something must be done." If I must set a theme, then let that be it. The problems facing the Congress today are real, and may remain unless you wish to change them. It is within your power to do so; in the final analysis the choice is yours.

AN ASSESSMENT OF FEDERAL PLANNING  
IN THE COASTAL ZONE

Reuben J. Johnson  
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As a general observation let us note that the term "coastal zone" has become prominent only in the last five years, although the actual area has been with us since the beginning of this country. Coastal lands were the first areas settled in our country and have grown to be the major areas for development, incorporating the largest cities and greatest industrial development. Of all places in the country, I believe New England exemplifies the growing significance of the coastal zone and thus the need for careful planning for this critical area.

Beginning in 1966 with the enactment of the Marine Resources and Engineering Development Act, a number of studies were made that brought into focus the uniqueness of what is now called the coastal zone. Probably the most widely known of these reports is that published by the Commission on Marine Science, Engineering and Resources entitled Our Nation and the Sea (sometimes referred to as the Stratton Report).

This report stresses that across the Nation and throughout the developed countries of the world, the pressures on shoreline space have mounted dramatically over the past 20 years and are certain to increase. The reasons cited for this increase in pressure are the shift of the population from the rural areas to the cities; the spread of suburban development into coastal areas; and the increased affluence in leisure time of the large part of our population.

These pressures are not likely to decrease. Certain major economic activities such as shipbuilding, fishing, and maritime commerce flourish only because of direct access to the ocean. Other satellite industries have found it expedient to locate near these major activities. The climate of the coastal areas; the opportunities for swimming, boating, fishing, and other aquatic recreation; and the aesthetic features will continue to draw an increasing number of people to these areas. This influx and the concomitant demand for use of the coastal zone resources accentuate the growing urgency for planned and controlled utilization; the ecological impact and environmental effect of such intensive use must be considered. Estuaries and marshes, which are life sources for fish and wildlife that move beyond state boundaries, need to be carefully studied as ecological systems that can be enhanced or destroyed by man's increased invasion.

It is characteristic of our nation that once a problem becomes critical in the eyes of the people, legislation follows that is designed to alleviate or resolve the problem. Examples of this reaction are (a) the Reclamation Act of 1902, when it was felt that the best interest of the nation would be served by encouraging development and population growth in the arid west; and (b) the Flood Control Act of 1936, which followed a series of large and devastating floods from some of our major rivers prompting a national interest in preventing future flood damage. Another recent example is that of the Water Pollution Control Act which followed a national awakening to the rapid deterioration of the quality of our water.

It is little wonder, therefore, that recent reports calling attention to the critical aspects of the resource of the coastal zone have resulted in proposed new legislation to deal with this problem. The three bills now in the Congress, S. 2802, S. 3183, and S. 3460, each with some variation, would establish a national policy and comprehensive program for the management, beneficial use, protection, and development of land and water resources of the nation's estuaries and coastal zone. Each of these bills recognizes that a major role in the coastal zone development must be taken by the States.

I shall not try to summarize the content of all three of these bills, but just for discussion purposes note that S. 3183 has a provision for making grants to any coastal State for the purpose of assisting in the development of a comprehensive management program for the land and water resources of the coastal zone. Such grants would not exceed 50 percent of the cost of such program development and would also be limited to \$200,000 annually for each coastal State. The Act provides that a further grant, also limited to \$200,000 annually, can be made to coastal States for not more than 50 percent of the cost of administering the approved management program. Hearings on all three of these bills are now being held by the Subcommittee on Oceanography of the Senate Commerce Committee.



The Federal interest and Federal agency programs in the coastal zone have been in existence for a number of years. However, they have been directed primarily to a functional emphasis. Examples of these programs include that of the Corps of Engineers, which has the responsibility for beach erosion control, construction of breakwaters, jetties, and the effect thereof on the coastline; for the development of navigation channels and harbors along the coast; for flood control involving streams draining or passing through the coastal zone; and for protection against hurricanes in coastal areas. The Federal Water Pollution Control Administration has a very positive interest in decreasing pollutants that are being dumped into the coastal waters and estuaries.

The Department of Housing and Urban Development has provided grants for studies of urban renewal and urban planning in the many urban areas in the coastal zone. I could cite many more examples of programs in the Departments of Commerce; Transportation; Health, Education, and Welfare; and other agencies in Interior. However, I believe this is adequate to make the point that these many programs, including those that are underway by the States and Local communities, need to be brought together to foster the common objective of optimum development and utilization of the coastal zone resource. Provisions of the proposed legislation would enable the States to exercise a positive coordinating role in this area.

The need for coordination of the many activities of Federal agencies; for establishing a closer Federal-State working relationship; and for assisting in developing State capability to participate in resource planning were the elements that resulted in enactment of the Water Resources Planning Act of 1965. The provisions of this Act are having and will continue to have a direct bearing on planning in the coastal zone. Let us see how this Act and the Water Resources Council are related to coastal zone planning.

Title I of the Act establishes a Water Resources Council consisting of the Secretaries of those departments that have the primary Federal role in the water and related land resources planning. The Council consists of the Secretaries of the Army; Agriculture; Interior; Health, Education, and Welfare; Transportation; and the Chairman of the Federal Power Commission. The Secretaries of the Departments of Housing - Urban Development and Commerce are associate members; recent proposed legislation would make them statutory members. A prime responsibility of the Council is to establish principles, standards and procedures for Federal participation in the preparation of comprehensive regional or river basin plans and for the formulation and evaluation of Federal water and related land resources projects.

Since November 1968, a special task force appointed by the Water Resources Council has been working on procedures involving a multiple objective approach to planning. The multiple objectives being considered are national economic development environmental quality, social well-being, and regional development. I believe a careful analysis of this procedure will show that it has many applications for planning in the coastal zone. It is particularly noteworthy that environmental quality would be a separate account in which the adverse and beneficial effects of any development or program would be fully described and made available to the decision maker.

Under the regional development account the benefits and costs to a region or a local area in the coastal zone would be set forth in order to view such benefits and costs in relation to other objectives. Analysis of programs for water and related land utilization by use of this multiple objective approach should assure that decisions in regard to immediate short-range projects in the coastal zone are made with broader, long-range considerations in full view.

The Water Resources Council has under its aegis a comprehensive framework planning program for the Nation. Under this program the water resources needs, based on a population projection up to the year 2020 with the inclusion of economic development elements, are weighed against water availability. The existing and emerging problem areas up to the years 1980, 2000, and 2020 are delineated. These framework studies are followed by comprehensive, multiple-objective, interagency studies leading to early-action programs. In both of these types of studies, the coastal zone is given consideration in regard to water needs and water availability.

Title II of the Water Resources Planning Act provides for a regional organization wherein the States and Federal government can join forces and work together in planning for the water and related land resources of a region. This is accomplished through the States requesting a river basin commission. New England was one of the first areas to request such a commission.

Under the able leadership of Mr. Frank Gregg, Chairman of the New England River Basins Commission, the objectives as indicated in the Act for such commissions have been advanced. These objectives stipulate that the commission (1) is to serve as the principal agency for the coordination of Federal, State, Interstate, and Local development for water and related land resources in this area; (2) is to prepare and maintain an up-to-date comprehensive coordinated joint plan for water and related land resources; and (3) is to recommend long-range schedules of priorities for the collection of data, investigation, planning, and construction of projects. I think it is particularly fortunate that you have this commission in operation with an active program at a time when the need for coastal zone planning has become critical.

The proposed legislation for coastal zones would provide for grants to coastal States for purposes of developing plans for optimum use of the coastal zone. As you know, Title III of the Water Resources Planning Act has a matching grant program for the States to increase their capability for planning of their water and related land resources. It is recognized that any planning that the States do under this program would require very close coordination with the management planning for the coastal zone because of the interrelation of the hinterland and the coastal zone. In some instances, States are utilizing their matching grant funds for aspects of coastal zone planning now. It is recognized that these funds are not adequate to do the full job required in coastal zone planning, and the Water Resources Council believes the additional grant as provided in the proposed legislation to be an urgent need.

In conclusion an assessment of Federal planning in the coastal zone shows that there is considerable activity underway. However, a primary need is to coordinate this activity so that Federal, State, and Local planning efforts will meet the objectives of national economic development, environmental quality, social well being, and regional development. The on-going comprehensive studies under the aegis of the Water Resources Council and river basin commissions will accomplish this, but not at a rate adequate to meet the growing need. The proposed legislation, through the grant program to the States, would expedite the planning to make it more consistent with the increasing pressure for using our coastal zone resource, and also assist in carrying out the plans as developed.

## A NATIONAL VIEW OF FEDERAL PLANNING FOR COASTAL ZONE MANAGEMENT

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Planning and development in the estuarine zone has largely been done on an independent piecemeal basis. The resultant losses to fish and wildlife resources and the habitat upon which they depend; the negatory impact on recreational, scenic, and aesthetic qualities; and the decline in water quality all appear to be proceeding at an increasingly rapid rate. Whole sectors of the public object, but economic and political pressures, particularly at the local level, seem to win out and the irreparable damages to estuarine and coastal regions continue.

It is evident that a higher order of planning and evaluation is needed. The planning must be both integrated and comprehensive and, in the concurrent evaluation, involve all the uses of the waters and the adjacent lands. The impact on the total environment must be considered and must be paramount to single purpose aspects.

It must be kept in mind that the importance of the estuarine and coastal areas is not limited to the coastal states and communities. The economic, social, and environmental use and well-being of the estuarine and coastal zones of the nation are of vital interest to the inland states as well. It is for these reasons that there must be a national program that gives adequate consideration to this breadth of interest and that embraces well-defined roles for the Federal, State, and Local levels of government as well as for public and private interests.

Any recommended national policy must reflect the fact that there is a strong national interest in the effective management and protection of the estuarine and coastal zone for the following reasons:

1. The pressures of population growth and economic development, including requirements for industrial, commercial, and residential development; recreation; exploitation of mineral resources and fossil fuels; transportation and other navigation; waste disposal; and exploitation of fish and other living marine resources, impose an increasing number of conflicting demands upon the finite resources of the coastal zone.

2. Estuaries, marshlands, and other parts of the coastal zone contain an extremely valuable habitat for fish and wildlife that move beyond State boundaries; such areas are vital to the life support of a major part of the nation's commercial and sport fisheries harvest. Such areas, particularly the estuaries, constitute ecological systems which are susceptible to destruction and disruption by man.

3. Continued unplanned or uncoordinated development activities in the coastal zone pose an immediate threat of irreversible harm to the coastal zone and its resources and a loss of the benefits it offers.

4. The coastal zone is a valuable area for multiple economic, recreational, and resource uses.

5. The interest in the coastal zone extends to the citizens of all the states, and is not limited to the citizens in the coastal states.

Accordingly, the National Estuarine Pollution Study recommended the following National Policy to the Congress in November 1969:

"Achievement of the best use of the values of the estuarine and coastal zones through a balance between: (a) multi-purpose development; (b) conservation; and (c) preservation over both the short and long range. Priority consideration should be given to those resources that are non-renewable and to maintaining those resources and uses which are estuarine-dependent. It shall also recognize that the primary responsibility for management of the estuarine and coastal zones rests with the States."

The principal goal of this national (not Federal) program is the use of the estuarine and coastal zone for as many beneficial purposes as possible and, where some uses are precluded, to achieve that mix of uses which society, based on both short- and long-range considerations, deems most beneficial.

The responsibility for leadership in defining the policy and objectives of a national program for the comprehensive management of the estuarine and coastal zones of the United States rests with the Federal Government. It is also the responsibility of the Federal Government to (1) implement its portion of the announced national program; (2) coordinate the activities of its respective departments and agencies; (3) define the Federal role to be established and maintained with State, Interstate, and Local governments as well as with a wide variety of public and private interests; (4) identify Federal jurisdictions in the estuarine and coastal zones, and to relate these jurisdictions to those of State, Interstate, and Local governments; (5) exercise its jurisdictional responsibilities to prevent the destruction and misuse of the resources of the estuarine and coastal zones; (6) evaluate the impact of Federal and federally-supported water and related land resource projects upon the downstream estuarine and coastal areas, especially for interstate and inter-national river basins; and (7) perform the functions that are exclusively Federal in nature in such a manner as to establish a leadership example for other governmental, public, and private interests.

These responsibilities coupled with the role that follows make up a rather thorough and detailed picture of the national interest in the estuarine and coastal zones.

The Federal Role recommended by the National Estuarine Pollution Study should be to:

1. Provide the impetus for the initial establishment, and progressive improvement, of the national program by the enactment of Federal legislation enunciating a national policy and providing grants to States for the development and implementation of comprehensive estuarine and coastal zone management plans.

2. Provide continuing support and guidance to the States through:

- a. grants to State, Interstate and Local programs;
- b. cooperative activities to prepare estuarine and coastal management plans initiated either by the States or by a Federal agency pursuant to established authority;
- c. technical advice and assistance;
- d. services such as navigation channels; flood control and protective works; beach restoration; aids to navigation; and environmental prediction, including weather, tides, and so forth;
- e. promotion, guidance, and support for cooperation among the States in managing interstate estuaries;
- f. recommendations and advice to the States and Interstate agencies concerning their estuarine and coastal zone management policies; and
- g. information and education to the public concerning estuarine and coastal resources, programs, and problems.

3. Complete and maintain the broad national inventory of the estuaries and coastal areas and their resources initiated by the National Estuarine Pollution Study and the Inventory directed by the National Estuarine Protection Act (PL 90-454).



4. Continue broad estuarine and coastal studies not of a local nature.

Examples are the National Estuarine Pollution Study by the Department of the Interior; the same agency's study under the National Estuarine Protection Act of the feasibility and desirability of establishing a nationwide system of estuarine preserves; the comprehensive study by the Corps of Engineers of Chesapeake Bay, authorized in 1965; and the survey by the Corps of national shoreline erosion problems, authorized in 1968.

5. Participate in local and regional studies where appropriate to assist local and regional management.

6. Assure appropriate Federal performance under regional and international obligations for the management of flyways, fisheries resources, and the like.

7. Exercise presently-assigned regulatory authority in the following areas:

- a. enforcement of water quality standards, as necessary, and various other controls over pollution including:
  - (1) oil, thermal, and radio-active pollution;
  - (2) disposal of vessel wastes;
  - (3) disposal of solid wastes and other refuse, dredged fill, etc., in navigable waters;
  - (4) treatment of wastes at Federal installations.
- b. issuance of permits, licenses, or other controls governing certain permissible uses or modification of estuarine and coastal resources including:
  - (1) permits for structures over and in navigable waters;
  - (2) regulations establishing harbor lines;
  - (3) regulations restricting use of navigable waters for various purposes (danger zones, fishing grounds, etc.); and

- (4) licenses regulating the construction and operation of non-Federal hydroelectric and nuclear facilities for generating power.

8. Coordinate Federal estuarine and coastal management activities and provide means for coordinating these activities with those of the States, their sub-divisions, and interstate agencies.

9. In cooperation with the States, continuously monitor developments and conditions in estuaries and coastal areas and evaluate the effectiveness of the national program.

10. Provide adequate investigation and consideration for the protection of estuarine values in the formulation of comprehensive river basin development programs under the aegis of the Water Resources Council by assuring cooperative State - Federal recognition of the impacts of upstream water quality and hydrology and related land resources development on the resources of the estuaries.

## THE FEDERAL ROLE IN COASTAL ZONE PLANNING

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"The coast of the United States is in many respects the nation's most valuable geographic feature"--in this way the Commission on Marine Science, Engineering and Resources (the Stratton Commission) opened its discussion of the Coastal Zone. A variety of ways in which the shoreline and the coastal waters are being used are outlined in the Commission report, "Our Nation and the Sea" (1969) and elaborated in the report of the panel on Management and Development of the Coastal Zone (1969). Some of you have read these reports, and I presume the reason why most of you are here is that you are concerned with the coastal zone. I don't wish to repeat what was in that report, except insofar as I believe it useful to emphasize one major premise underlying our recommendations.

The premise is as follows: The uses of the coastal zone are increasing. This trend will continue and probably accelerate. The increasing pressure on the coastal zone is causing an increasing variety of management problems. Some uses of the coastal zone are in conflict and some uses may be incompatible with one another. As we look to the future one can see that these management problems will increase.

## The Uses of the Coastal Zone

The most intensive uses of the coastal zone occur at the water's edge. Seaward the problems become fewer, if not simpler; at the edge of the continental shelf, problems of conflicting uses are the exception to-day. We are persuaded, however, that problems of multiple uses of the coastal zone are moving seaward.

Without going into detail, let me remind you of some of the coastal zone problems:

Pressures on shoreline space have mounted dramatically over the past 20 years. The reasons are clear: the shift of the population from rural areas to the cities (the nation's seven largest metropolitan areas are on the Great Lakes or the sea coast); the spread of suburban development into coastal areas; and the increased affluence and leisure time of a large part of our population.

Recreation is one of this country's fastest growing industries and marine recreation is becoming more popular and varied. Scuba diving and surfing have become major sports in the last 20 years. I think California's plan to develop underwater parks is the trend of the future. I believe we will see small submarines and underwater habitats widely used for recreation in another 20 years.

Recreation means different things to different people. For some it is high density marinas, concentrated swimming beaches, and cottages packed cheek to jowl. For others it is a chance for solitary surf casting, a sail into a desolate cove, or a walk on a deserted beach. A major management problem for the future is to provide the necessary variety of recreational uses in the coastal zone.

If recreation and housing developments were the only pressures, I would be more optimistic about the solution of the Coastal Zone management problem. I think one could hope to develop a compromise that would satisfy both groups and would also be acceptable to those who are justifiably worried about the conservation of our natural fisheries and wildlife. I don't claim it would be easy, but I think it could be managed.

There are, however, other uses--some traditional, some new. Heavy industry has a very major stake in the coastal zone and its needs cannot be ignored. For many industries the transportation cost of raw materials is a major item, and the cheapest way to transport large quantities of bulk material whether it be oil or iron ore is by ship. The material going in and out of U. S. ports has increased 60 percent in the past decade. The jumbo tankers and the container ships have made many of our old ports obsolete. The need for deep water ports and the concurrent sites for heavy industry is evident; witness the excitement of the past two years about Machiasport and other deep water harbors in Maine.

Then there are the ocean resource industries. I don't know that we will see a marked increase in our offshore fisheries in the next decade, but I think the Northeast will continue to have a major fishing industry. The resource industries that will grow are those that are just beginning, such as sand, gravel, and oil. The offshore oil industry accounts for some 15 percent of the total production today and it is expected to eventually be as high as 30-40 percent. There seems to be little doubt that there is oil on our continental shelf and I suspect it is only a matter of time before we have offshore production with all the concurrent problems and opportunities.

There are three other possible uses of the coastal zone that are perhaps a bit further in the future.

The first possible use is the floating jet ports. The need for major airports along the coastal megalopolis is clear, but nobody wants them close by and the increased noise level of the supersonic planes of the future will intensify the desire to get these airports some distance away. The possibility of an airport in Long Island Sound has been investigated and I expect we will hear more about this use of the coastal zone in the future.

My second use relates to electrical power plants. A recent report of the Office of Science and Technology indicates that some 250 large, new electrical power plants will be built in the next 20 years and that our electrical capacity by 1990 will be about 1 million megawatts--triple our present capacity. These plants are only about one-third efficient; this means that for every unit of electrical energy they produce, they also produce two units of heat energy. The numbers are staggering. In ten years a volume of water equivalent to 20 percent of the fresh water runoff of the United States will be needed for cooling water for these plants. In my opinion something has to give; we will have to take an entirely new look at the economies of power production and transmission. Why not put all the new hydroelectric power plants on the ocean shore? This would minimize the thermal pollution problem. The transmission lines of this nation are already pretty well tied together as we learned to our dismay in the Northeast blackout of a few years ago. Coastal power production would mean that the absolute cost of electrical power to the interior of the country will be quite a bit higher because of the long transmission distance. I suggest we set the power cost at the federal level and charge the same rates everywhere in the country.

This will not be the first time that we have set an artificial rate structure in this country. The average cost of electrical power will increase but the costs of a lot of things are going to increase as we move against our various pollution problems.

My third example of a new use for the coastal zone is aquaculture. I think there is little doubt that we will be growing increasing quantities of shrimp, oysters, scallops, salmon, and other high priced seafood under controlled conditions in the future. To do it we will need the farm land, and that farm land is in the coastal zone. I am not sure of how much of the coastal zone will be needed. I suspect the requirements are more comparable to modern chicken farming than to cattle growing; but some part of the coastal zone will be needed, and there are many who feel that the greatest problems in aquaculture today are not technical, but institutional. How does one buy or lease the necessary land and water area? This is a difficult problem in most if not all New England states. I could go on, but I think the point is clear. "The coast of the United States is in many respects the nation's most valuable geographic feature." The pressures on it are increasing. We must use it wisely.

#### The Management Problem of the Coastal Zone

A major conclusion of our Commission was that the primary problem in the coastal zone was a management problem with all the attendant difficulties that proper management implies. In reviewing the situation, we concluded that effective management to date has been thwarted by the variety of government jurisdictions involved at all levels of government.

If you believe, as did the Commission, that a more effective management system is required, one of the first question to be settled is the operational level of government of such a system. It could be federal, regional, state, or local. All levels are involved and all should be involved; we concluded, however, that the management task was primarily a state responsibility and that the federal government should encourage the states to accept this responsibility. Even the most ardent federalists amongst us despaired of ever doing an effective job at the federal level. It seems highly unlikely, even if it were considered desirable, that all of the authority and functions related to the coastal zone would be delegated to a single agency. Such authority and functions are currently scattered throughout the federal establishment. The most that one could expect would be a somewhat more powerful and effective Marine Council or Water Resources Council.

We recognized, of course, that state boundaries are usually not natural division lines for the coastal zone. For example, Lake Michigan, Chesapeake Bay, and Delaware Bay are shared by more than one state; it could be argued regional management would be preferable. The objection is a valid one, but we do not believe most states are willing to transfer the kinds of power and authority we have suggested to regional groups.

Furthermore, we were persuaded that

"in most cases sound planning and management undertaken by one state probably will not differ greatly from that undertaken by an adjacent state. When differences do arise; they may be settled by direct negotiations between the parties concerned or by the establishment of ad hoc interstate committees on an interstate commission or compact. Strong Coastal Zone Authorities representing the variety of state interests will facilitate such agreements."



### The Coastal Zone Authority

It is one thing to say that the states have the primary responsibility and that in most cases the states currently lack adequate machinery for the task. It is more difficult to come up with specific suggestions. We felt each state needed an agency with sufficient planning and regulatory authority to manage coastal areas effectively and to resolve problems of competing uses. Such agencies should be strong enough to deal with the host of overlapping and often competing state organization is essential to surmount special local interests, to assist local agencies in solving common problems, and to assist strong interstate cooperation. However, we were a federal commission, and our recommendations had to be made to the President and to Congress.

Specifically, we recommended that:

"a Coastal Management Act be enacted which will provide policy objectives for the coastal zone and authorize federal grants-in-aid to facilitate the establishment of state Coastal Zone Authorities empowered to manage the coastal waters and adjacent land."

The federal government cannot compel a state to develop a special organization to deal with coastal management problems. By such an act, however, it can encourage a state to do so.

We also recognized that the great diversity of resources, scope, and activities of coastal state governments will prevent adoption of a uniform administrative approach to state Coastal Zone Authorities. In some states a single Authority might appropriately be given jurisdiction over the state's entire coast; in others, several groups might be established under a single Authority within a state to deal with separate estuarine areas.

The form of a State Authority may vary from a volunteer commission with a small staff to an agency like the New York Port Authority with major development authority buttressed by the power to issue bonds. We also thought that the extent to which any state wishes to delegate authority to local or regional groups can, within certain limits, be determined by the state.

The guiding principles for the Authorities should include the concept of fostering the widest possible variety of beneficial uses. Public hearings should be held when necessary. All information and actions should be a matter of public record. Most important, the Authority must represent all legitimate interests in the coastal zone, and not be dominated by any single interest, such as fishing, recreation, industrial development, or conservation.

The Commission believed the following powers should be available to the typical Coastal Zone Authority:

"Planning--to make comprehensive plans for the coastal waters and adjacent lands and to conduct the necessary studies and investigations.

Regulation--to zone; to grant easements, licenses, or permits; and to exercise other necessary controls for ensuring that use of waters and adjacent lands is in conformance with the plan for the area.

Acquisition and eminent domain--to acquire lands when public ownership is necessary to control their use. (Condemnation procedures should be used if necessary.)

Development--to provide, either directly or by arrangement with other government agencies, such public facilities as beaches, marinas, and other waterfront developments and to lease lands in its jurisdiction, including offshore lands."

With respect to the latter point, I should note that the Commission recommended that:

"States develop procedures to permit the leasing of offshore areas for new uses consistent with the overall plan of the State Coastal Zone Authorities for the development of these areas." (We referred to these as "seasteads" in analogy with the Homestead Act of 1862.)

The Commission recommendations on the coastal zone appear to have found the widest acceptance. Legislation to implement these recommendations has been introduced in both the House and the Senate and hearings have been held in both houses. Some bills have administration endorsement and some do not. (There is a slight problem of jurisdiction that is related to a larger problem of reorganization of ocean affairs, but this is expected to be resolved fairly soon.) It seems very probable that there will soon be some form of federal legislation implementing the coastal zone recommendation of the Stratton Commission.

Even more exciting, I believe, is the number of states that are moving on the Commission's recommendation without waiting for Congress. States are responding in different ways, but in such states as Hawaii, Florida, North Carolina, California, Maryland, Texas and Rhode Island there is a move to reorganize the state government in order to handle the problems of the Coastal Zone. Last year, Governor Licht appointed a task force on Rhode Island's Coastal Zone to advise him on what should be done. A report was submitted in February. Legislation was introduced in the current session of the General Assembly; a broadly representative Coastal Zone Council with far-reaching powers for planning and eventually managing Rhode Island's Coastal Zone was proposed.

Interest in these matters can be found in many quarters. This is not the first such conference on the Coastal Zone nor will it be the last. The contribution of the Office of Sea Grant College Programs (National Science Foundation) and the support of other public and private agencies in this conference is indicative of regional and national concern. The cause is a good one, but the problems are not easy. We have a tendency in this country to think that most problems can be solved if we only develop the correct organization. I think organization will help, but keeping people continually aware of the problems is perhaps even more important.

#### Literature Cited

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## EXPERIENCES IN COASTAL ZONE MANAGEMENT

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I have been asked to discuss some examples of coastal zone management problems to illustrate the types of mechanisms that can (or perhaps cannot) be used to solve them. In doing so, I will limit myself to incidents that occurred in North Carolina because I have a more intimate knowledge of the events at home.

The first case took place several years ago when the US Army Corps of Engineers advertised for bids on a maintenance dredging project on a section of the Atlantic Intracoastal Waterway. The Corps made copies of the work plans available to State and Federal resource agencies prior to awarding the contract, not because it was required by the Fish and Wildlife Coordination Act, but in an effort to coordinate their operations with those agencies. The particular section of the waterway concerned ran through a very narrow and very fertile estuary, an area that traditionally produced large quantities of intertidal oysters as well as clams, shrimp, and crabs. It was also an area in which the bottom consisted of very fine soft sediments.

In response to the Corps' notification, both State and Federal agencies expressed concern that unconfined spoil would endanger clam and oyster resources and strongly recommended that every effort be taken to confine all spoil to the Intracoastal Waterway right-of-way. Unfortunately, these recommendations were not followed, and more than 400 acres of bottoms outside the designated spoil easement were covered, resulting in extensive shellfish losses. Efforts to secure voluntary cooperation from the dredge captain were unsuccessful, so the State resorted to more drastic action.

The dredger was served a restraining order that required him to keep all spoil within the right-of-way. The State alleged that he had trespassed on State property by depositing spoil on State-owned bottoms and in doing so had damaged natural resources held in trust for all the people of the State. The resultant show-cause hearing served to strengthen the State's position and brought forth an unexpected source of assistance: the dredger's insurance company. Although the dredger could continue (and in fact had been continuing) to work on the project without violating the terms of the injunction, his insurer refused to insure him under those conditions. The project was stalled for almost six months; costs accumulated for all concerned while attempts were made to resolve the issue out of court. At the eleventh hour, these efforts were successful and the case was never heard on its merits. What was gained? First, the District Engineer adopted a sincere policy to work with State and Federal resource agencies in early planning stages and throughout the development of a project and to give considerable weight to recommendations received from the resource agencies. Second, the State learned that it had a powerful weapon: a restraining order based upon trespass, that could be used in the absence of any more specific control mechanism. Third, the dredging company learned that its insurability could be impaired if it continued careless practices.

The second case involved work in navigable waters. A permit for such work from the Corps of Engineers is required. During 1967, North Carolina initiated weekly surveillance flights over the estuarine region, and the coordinates of every piece of earth moving equipment were reported. On one such flight, a dredge was seen engaged in filling operations in a salt marsh. A check of active Corps permits disclosed that none had been issued for this work, so the District Engineer was notified.

Almost a week was lost in exchanges of letters and on-site inspections before the Corps notified this operator to cease his unlawful work until a permit was secured. The operator ignored the Corps' admonition and completed his work. Today there is a trailer park on this marsh. I was informed that it recently was inundated by only a small storm tide, so there it sits: a menace to health and safety and a monument to irrational development of the coastal zone. What was learned? No State should rely on the Corps of Engineers to fight its natural resource wars. The Corps is traditionally not a law enforcement agency, nor does it have the field capability to maintain surveillance over the coastal zone and to effect speedy legal action where necessary. Similarly, the Department of the Interior is not known for its efficient law enforcement, nor does it possess the necessary field surveillance capability.

The third case concerns a dredge-and-fill project carried out under a lawful Corps' permit in full agreement with the State. By this time North Carolina had developed an efficient system for coordinating the comments of all cognizant State agencies relative to each public notice by the Corps. The applicant's first proposal was not acceptable to the State; no dikes or spillways were indicated and a nearby public oyster management area might have been damaged by unconfined spoil. The second application contained the necessary protective devices, and was approved by all concerned (the land to be filled lay above mean high water and was owned by the applicant). Unfortunately, several things went amiss. In order to move the dredge into position (or perhaps to gain additional fill material), a channel was excavated through the oyster management area. Subsequently, the dikes blew out, depositing spoil over many of the oysters that were missed during dredging. As a finale, a quantity of oil appeared, polluting those oysters that were left.

Oddly enough, no legal action was ever filed by either State or Federal agencies, though there appeared to be sufficient grounds for both. In this case, the developer was a well-known, well-respected, and public-spirited citizen with considerable political power. The Corps acknowledged that there had been deviations from the terms of its permit, but found that these deviations were not sufficient to warrant legal action on their part. There was no doubt about the oil spill, but the difficulty of proving its source, much less proving gross negligence or wilfulness as required under the Oil Pollution Act of 1924, dissuaded both State and Federal agencies. The new channel through the oyster management area was obvious to everyone, as were the broken dikes and unconfined spoil, but the State was still reticent to take action. For almost a year, the State attempted to work out some sort of a settlement under which the developer would acknowledge State ownership of the shellfish resources (on bottoms claimed by both parties) that his actions had destroyed and would provide at least token compensation for damages. The issue might never have been resolved if this developer had not applied for a second permit to dredge. As you might surmise, this application provided the State with sufficient leverage to negotiate a settlement under which it received a sizeable area of unspoiled salt marsh on a long term lease arrangement at a nominal cost. What was learned?

First (and again), the Corps is not a resource agency; do not expect it and its permit to be effective tools for comprehensive coastal zone management. In fact, there is considerable doubt that the Corps can refuse to grant a permit for work in navigable waters on grounds other than the project's effect on navigation.



Second, laws which can be easily circumvented, such as the old Oil Pollution Act, are a detriment to everyone: better to have none than to have one that provides only a facade of protection.

Third, regardless of the laws, we must face political realities. There will be times, in any State, where legal action will be difficult or impossible to obtain, but these times are becoming rarer as people become more involved in and incensed over environmental matters.

Fourth, a good legal foundation (in this case the necessity for a subsequent permit) can provide a powerful position from which to negotiate; and, ultimately, coastal zone management will consist of a great deal of negotiation and compromise.

The fourth case concerns residential development on one of our outer banks. In the fall of 1967 the North Carolina State Department of Administration received a request for an easement to remove fill from State-owned bottoms in order to construct an extensive venetian-type residential area. The proposed project would have destroyed all marshes between the banks proper and the Intracoastal Waterway--essentially all the estuary of that area.

For almost a year the Department of Administration delayed taking action on the request in hopes the developer would agree to change his project in order to preserve at least part of the estuarine system. By October of the following year, no such action had been taken and the developer applied for a Corps of Engineers' permit in accordance with his original plan. For some (as yet) unexplained reason, the Attorney General's office filed a statement declaring no State interest in the land concerned and the consolidated position of State agencies indicated no serious objection to the project.

Under the conditions of the Fish and Wildlife Coordination Act, however, the Corps of Engineers had provided copies of this Public Notice to the U.S. Fish and Wildlife Service, Division of River Basin Studies. River Basins indicated complete opposition to the project and refused to back down from this position. In accordance with the agreement between the Department of the Interior and the Department of the Army for handling such matters, the permit application was forwarded to Washington for resolution. About this time, State officials realized resolution by authorities in Washington might cast some doubt on the State's ability to manage its own resources and the Washington decision might not really be in the best interest of the State. They therefore notified the Department of the Interior that the Attorney General's earlier statement had been retracted and the case reopened, whereupon Interior effectively shelved the whole matter and that is where it rests today.

For almost three years the developer has been prevented from any beneficial use of a valuable area, part of which he owns. The State still has no master land use plan for the coastal region, nor any adequate criteria or guidelines for supporting or opposing issuance of a Corps' permit. The Corps, as a disinterested but reasonably honest broker, is caught between the two opposing factions.

The fifth case concerns a large island and marsh complex at Cape Fear. This area is less than 30 miles from the City of Wilmington, bounded on the north by about five miles of salt marsh and shallow tortuous channels and on the west by the treacherous channel of the Cape Fear River. The area has not been seriously affected by man's activities; however, various persons have devised schemes to "develop" it for almost 40 years. During the last 11 years, these schemes have collided headlong with equally militant views of preservationists who would like to see the area remain a virtual maritime wilderness.

This case has a number of interesting ramifications. The present owner claims title traceable to the Crown of England that allegedly conveys everything between the Atlantic Ocean and the Cape Fear River channel. However, the area concerned contains about 9,000 acres of salt marsh and an intricate complex of tidal creeks and other natural channels. Whether the Crown intended to convey these areas, now navigable waters, is open to serious question.

The land owner would like to develop his land, but he really does not know how much of the land is his. The State would like to at least control any development that takes place, but does not really know how much jurisdiction it may have over activities on private lands wherever they may be. Coincidental with the current environmental crusade, a large number of North Carolina citizens, including the Governor and the Chairman of the Board of Conservation and Development, have taken the position that this area should be acquired for public purposes by whatever means possible. Both the developer and the State, therefore, are in interesting positions. If the State negotiates a purchase, how will it know if it is buying lands (or at least some lands) that it already owns? If the developer attempts to implement his plans, how will he know how much freedom he will have to do as he wishes? If the State does acquire it, what would it do then? Will it attempt to preserve the entire area in pristine pureness, endearing itself to the militant conservation element while alienating the moderates and those who push for economic development? Will it attempt to accommodate the maximum possible public use, thereby endangering the natural resources it has set out to conserve? Or will it attempt to accommodate a broad range of interests? I do not know, and neither does the State.

I hope these few incidents serve to illustrate the dilemma facing natural resource administrators in the day-to-day execution of their business. I have deliberately avoided any philosophy or mention of principles--these are both easy to talk about but frequently do little to assist the fellow who has the "go, no-go" responsibility in natural resource decisions.

I would like now to discuss some of the steps North Carolina is taking to avoid conflicts such as I cited earlier and to profit from the shortcomings of the past.

In the spring of 1968 a special Estuarine Study Committee recommended that North Carolina enact a comprehensive estuarine management program with the powers to effect coordination among existing agencies; exercise control over alteration of estuarine lands and waters; acquire interests in such lands and waters; maintain a continuing inventory of the condition of the State's estuaries; carry out necessary surveillance of the coastal region; and effect such law enforcement as may be necessary. Under this recommendation the State agency given principal jurisdiction for the program would be guided by an Estuarine Council composed of ex-officio representatives of State agencies and supplemented by private citizens appointed by the Governor. Applications for work in estuarine lands and waters, and recommendations for State acquisition for such areas would be reviewed by the Council. The Study Committee also recommended that \$1,000,000 be provided for acquisition of essential coastal areas.

Although we are only in the preliminary stages of our work on this contract, I would like to briefly outline some of the salient features of the plan in hopes that they might benefit you in your work here in New England. We first reviewed existing State and Federal statutes, regulations, and Executive Orders so as to determine which agencies should be involved in the project. From this exercise we concluded that the Federal Departments of Defense, Interior, Agriculture, and Housing and Urban Development; the Coastal Plains Regional Commission; 18 State agencies; 5 classes of special districts; and the 25 coastal counties would be directly involved in plan formulation and execution of the study. We then defined the study elements, each of which should initially be treated as a discrete entity to facilitate the gathering of individual data components.

The broad categories of elements are:

- (1) Statement of policy and intent.
- (2) Delineation of the estuarine region (coastal zone).
- (3) Natural resource potential.
- (4) Present and proposed uses.
- (5) Ownership and administration.

Local, State, and Federal agencies have been asked to provide specific information in one or more element categories and have, for the most part, accepted the work. Whenever possible, units of the different levels of government, or different units at the same level, were linked in the initial phase of the planning process.

One of the most important parts of element development will come from local government units in the form of existing land classifications and land use ordinances. These are of vital importance to the implementation and operation of the plan, since the greatest individual impact will be felt at the local level.

The 1969 General Assembly acted upon some, but not all, of the Study Committee's recommendations. It provided one-half million dollars for the acquisition of critical, valuable estuarine areas; initiated a permit system; and directed that a management-oriented study of the State's estuaries be conducted by the Commissioner of the Division of Commercial and Sports Fisheries, Department of Conservation and Development.

Under the provisions of G.S. 113-229, a permit must be secured from the North Carolina Department of Conservation and Development before any excavation or filling project is begun in any estuarine waters, tidelands, marsh lands, or State-owned lakes. Applicants must furnish a plat of the area concerned and a deed or other instrument under which the applicant claims title or interest. Permit applications are circulated among State agencies and furnished to adjacent land owners, all of whom are invited to submit comments. In passing upon an application, the Department must consider:

- (1) the value and usefulness of the project to be served;
- (2) its effect upon use of the waters by the public;
- (3) the value and enjoyment of the project upon adjacent owners; and
- (4) wildlife and fresh water, estuarine, or marine fisheries.

The Department must issue a permit if it finds the proposed work is not contrary to the public interest, but may stipulate conditions to the permit as necessary to protect the public interest. If any State agency or the applicant objects to the action of the Department regarding a permit application, the Department is required to assemble a Review Board composed of State agency directors who must hold a public hearing on the matter. After hearing evidence from all interested persons, the Review Board may affirm, modify, or overrule the previous action of the Department.

Should the applicant still feel aggrieved, he may appeal to the Superior Court having jurisdiction in the county where the project is located. The permit program is administered through the Division of Commercial and Sports Fisheries and authorizes both civil and criminal penalties for violations.

The estuarine study authorized by the 1969 General Assembly was probably the session's greatest contribution towards a coastal zone management system. The Commissioner of Commercial and Sports Fisheries was directed to "study the estuaries of North Carolina with a view to the preparation of a comprehensive and enforceable plan for the conservation of the resources of the estuaries, the development of their shorelines, and the use of the coastal zone." In conducting his study, the Commissioner was authorized to consider all legitimate uses of the coastal zone and to involve all cognizant agencies of Local, State, and Federal government. In order to assist him in his efforts, the Commissioner contracted with the Coastal Zone Resources Corporation to prepare the Plan of Study. Under the terms of our contract, we have contacted representatives in all coastal counties, 18 State agencies, and 3 Federal agencies. On March 15 we submitted a preliminary draft of the plan to the Commissioner. The purpose of this draft was to establish the framework for subsequent discussion and to solicit comments and suggestions from all interested parties. We have since met with all the above groups and are now in the process of incorporating their suggestions into a second draft. This will also be circulated and comments received will be considered in the preparation of a final draft that is to be submitted to the Commissioner in July.

I cannot over-emphasize the necessity to bring the local governments into the picture at as early a point as possible. The people on the local level must become convinced of the need for the program and must actively support it. Differences of opinion must be unearthed and resolved. Local opposition, particularly if uncovered at a late date, can effectively prevent or seriously hamper implementation of the management scheme.

The preparation of the final plan entails consolidating the elements into a single package that will designate the best use for each area and the means of achieving such use. As this process will involve considerable negotiation among interested parties and tactful use of authority, we recommended that it be effected under the immediate direction of the Commissioner of Fisheries, along with the continued use of the coordination system established in the plan formulation.

In order to provide a geographical framework for the plan, we propose that all coastal counties be included. Within such counties we proposed that two basic types of areas be delineated.

- (1) "Lands and waters, the development and use of which does not produce significant environmental effects at the State Level."

This category would include all lands within the coastal counties lying above the designated "critical zone" boundary line (for example, a 100-year flood line or another appropriate and available line), exclusive of areas now under State ownership or proposed for acquisition prior to 1980. The counties would be encouraged to regulate land use in these areas by means of their existing power. In essence, the administration and regulation of these lands would be considered an intra-county matter.



- (2) "Lands and waters, the development and use of which do produce significant environmental effects at the State Level."

This category would include all watercourses, all lands lying below the designated "critical zone" boundary line, and all lands now in State ownership or proposed for acquisition prior to 1980. Within this category, counties would be encouraged to continue or to develop planning and zoning programs, but such programs would be subject to some overriding State authority.

Such State authority could be exercised through a single agency or regulatory mechanism, but will more likely be administered through a series of complementary authorities (either in existing or modified form) under the overall coordination of a single agency (for example, a Coastal Zone authority). It is imperative that maps of the second class of lands, or those below the "critical zone" boundary line show:

- (a) areas proposed for State acquisition and the purpose of such acquisition;
- (b) areas to which the existing Department of Conservation and Development permit is applicable and the types of activities that will be permitted in such areas;
- (c) areas leased from the State and the purposes of such leases;
- (d) areas recommended for residential, commercial, and industrial development; and
- (e) areas subject to other State or Federal controls.

We suggested that the "Element Development" phase be completed by March 1971, that synthesis of the elements into a cohesive plan be conducted from March 1971 to January 1972, and the remainder of 1972 be devoted to public hearings, revisions, and publication. Under this time schedule, the plan would be presented to the 1973 General Assembly for necessary legislation and funding.

Since release of the preliminary draft plan of study on March 15, we have met with and received comments from most of the agencies identified earlier. Their reactions are illustrative of the problems that will be encountered by any such effort.

A number of State agencies recommended that the planning process be accelerated so that the final plan could be submitted to the 1971 General Assembly, in which our current Governor would be able to exert considerable influence. A smaller but still significant group of agencies urged extreme caution, indicating that they felt 1973 was too soon.

As might be expected, several county officials objected to any infringement of existing county authority by the State. County planners, however, seemed to view the State interest as support for their efforts toward more efficient county planning and zoning.

At the present time we are awaiting guidance from the Commissioner of Commercial and Sports Fisheries. If the plan progresses too swiftly, it risks jeopardy from shallowness and lack of local involvement. If it progresses too slowly, it risks losing the political support it now has at the State level, and may miss the crest of the environmental crusade.

The State's decision must be made soon--1971 is approaching rapidly. Only history will show whether it was the right decision and whether North Carolina is approaching Coastal Zone Management in a rational and successful manner.

REGIONAL PLANNING AND THE CHESAPEAKE BAY ENVIRONMENT:  
AN ECOLOGICAL APPROACH

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Hallowing Point Field Station  
Prince Frederick, Maryland

Past regional planning efforts have, for the most part, taken little advantage of basic ecological relationships. This has happened for a number of reasons: (1) lack of understanding by the planner as to the relationships between man and his environment; (2) planning objectives that had economic motives which did not incorporate environmental values into cost-benefit analysis; and (3) lack of trained ecologists capable of providing useful inputs to regional problems of human ecology.

In spite of what many may think, man is a simple organism, subjected and vulnerable to all the ecological rules that govern the well-being or that determine the survival of our fellow plant and animal species. We are a product of the environment and cannot escape our long evolutionary history. Lacking the proper environment, we too can travel down the long road leading to social and economic degradation and ultimate extinction.

Man's primate ancestry dates back millions of years. Until recently, our numbers were few and we were basically wanderers following a food supply. To begin with, we had little impact on the environment. In recent history, our technology improved, our numbers increased, and large communities emerged. Today we have considerable impact on the environment. This entire pattern of both increased technological capacity and increased numbers with concomitant environmental change is now undergoing tremendous acceleration.

Figure 1 plots the world's technological capacity against time, and indicates that we are at the "knee" of a developing curve: a curve that has exponential characteristics. This same curve may be used to plot population numbers and production values for various goods and services for society. Unfortunately it may also be used to demonstrate the amount of waste materials we are casting out into our surroundings. Clearly, we are at a threshold point in the history of man and his relationships with the environment. The sociological implications are interesting to contemplate, since in rapidly changing his environment, man is in turn socially modified due to environmental feedback.

When a significant environmental change occurs, living plant and animal populations generally respond in one of two ways: they may increase in numbers when the change is a favorable one for the population being measured; conversely, an unfavorable change may cause a population to become extinct. Figure 2 indicates that when a species or population is introduced into a given environment, it shows a typical sigmoid growth pattern until it reaches some equilibrium point with its surroundings. Periodic, seasonal fluctuations may occur, but a mean annual density (dotted line) can be determined. An environmental change, often a very subtle one (arrow), can cause the population density to change drastically.



# World Technological Capacity

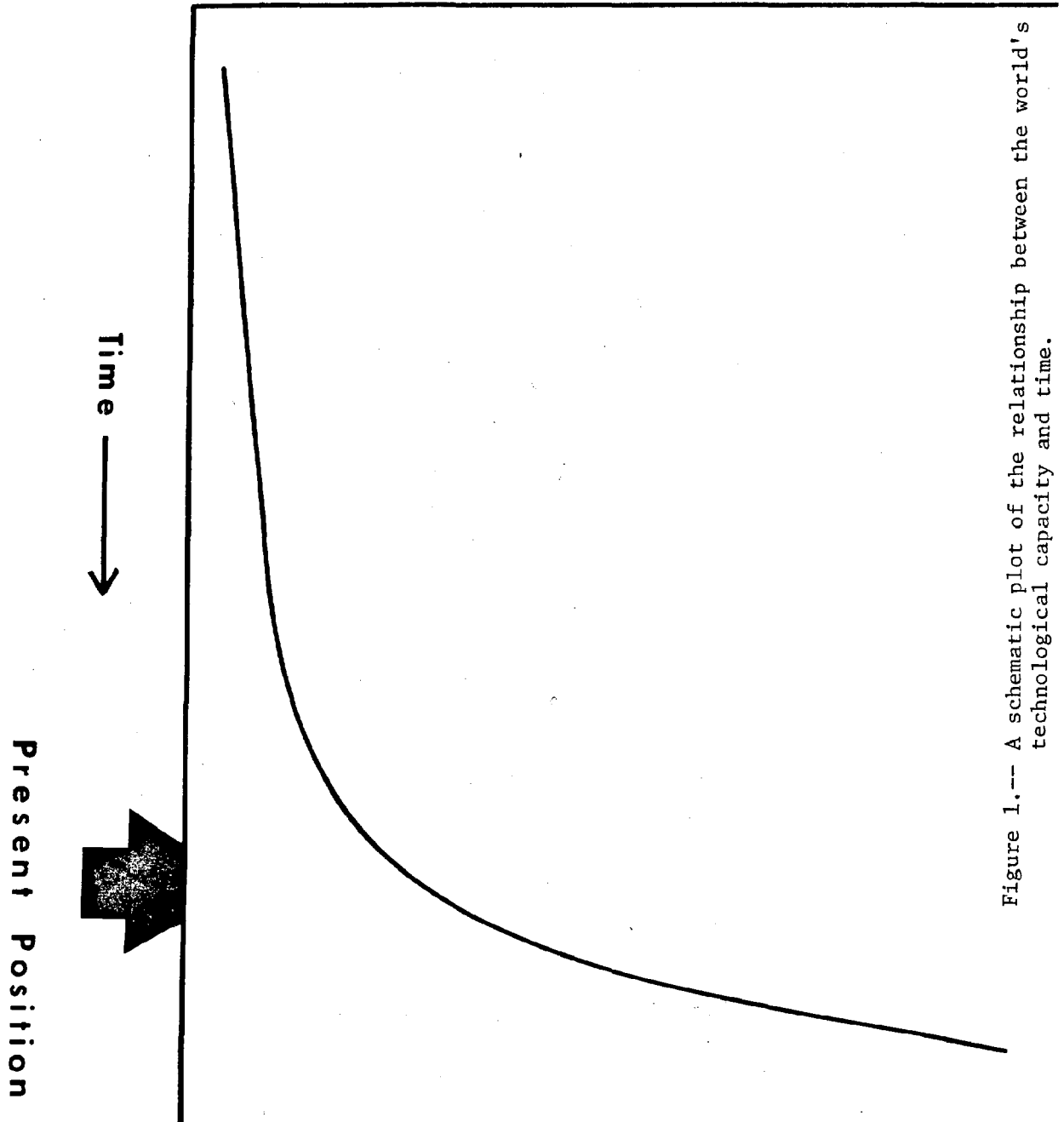


Figure 1.-- A schematic plot of the relationship between the world's technological capacity and time.

# POPULATION GROWTH

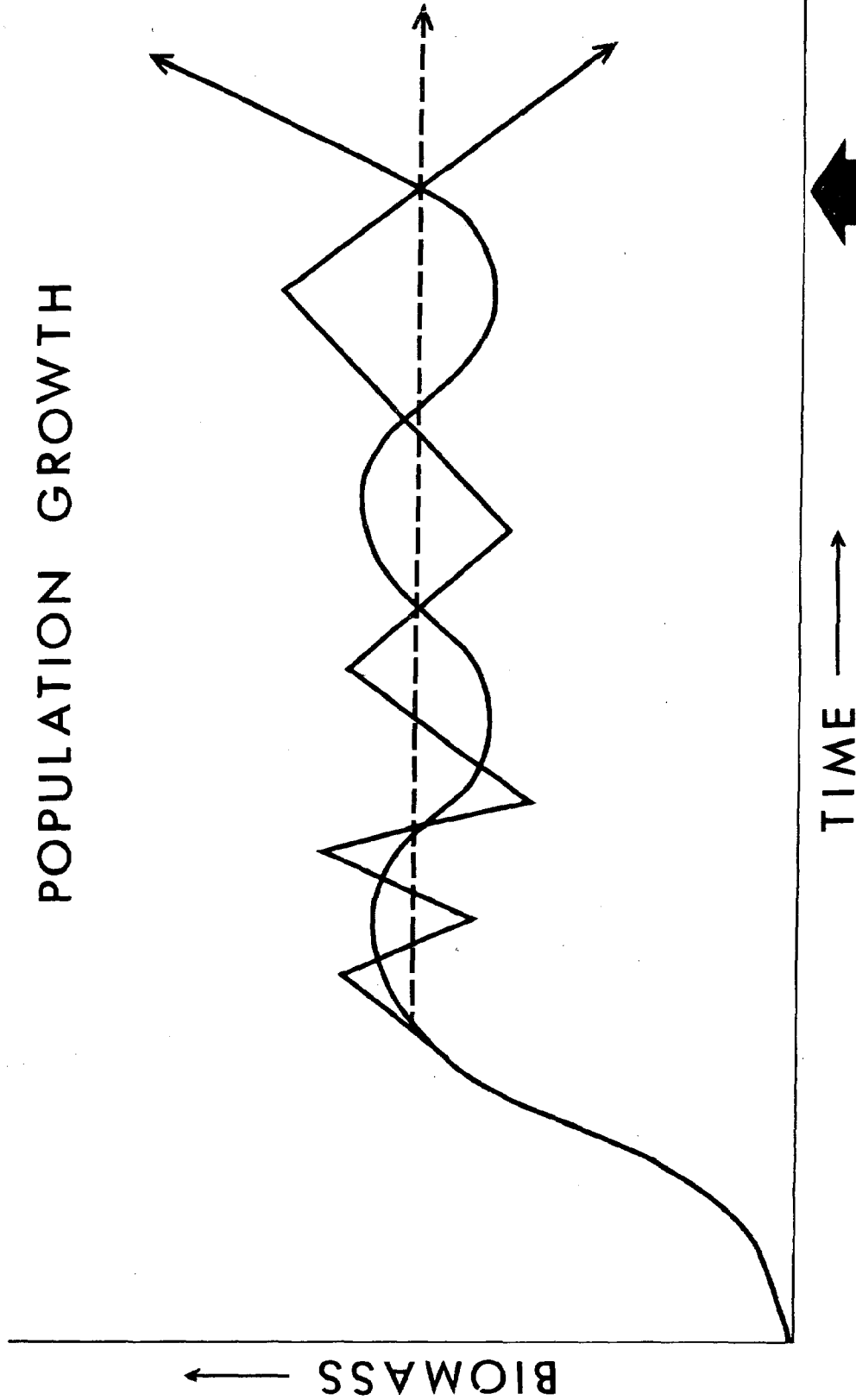


Figure 2.-- A schematic plot of general population growth as a function of time. Note that after an initial period of rapid growth, the biomass oscillates about some average value (dotted arrow). The dark arrow on the time base signifies an environmental change and the possible effect on the population is indicated by the arrow direction.

If the organisms that are increasing are of a kind useful to man, the environmental change can be considered beneficial. Even the most careful farming practices cause significant modifications. Present agricultural areas of the northeastern United States, for example, in no way resemble the primitive forested landscape. Except for certain pesticides, we do not consider the changes imposed by good farming practices to be a pollution problem. These are planned, controlled, and directed modifications designed to enhance the environment in a way to increase the numbers or biomass of desirable food organisms.

The unplanned, uncontrolled, and undirected changes caused by industrial or domestic activity and wastes are creating conditions that wipe out many of our useful organisms. Such polluted regions are increasing in size and are now growing together. One only need fly over our northeastern "Boswash" megalopolis (Figure 3) to develop some perspective; that is, if it is possible to see through the man-made fumes covering the terrain.

From the viewpoint of human ecology--and this is the proper viewpoint that all of society's decision makers should maintain--it is quite clear that we will never achieve a good quality society unless we also provide a good quality environment. Truly, society's ills such as poverty, civil rights, and lack of compassion for people will never be cured unless there is a desirable environment. The sooner all of the regional and world decision makers realize this basic fact the sooner we can get on with the most important job that has ever faced mankind.

Our present economic philosophy that guides regional and world decision making is a dollar-profit in motivation, operates within a competitive market, and dictates that the product or service be sold or acquired as cheaply as possible. To achieve contemporary economic objectives, many standard operating procedures such as mass media advertising, lobby pressures, and political manipulation have evolved.

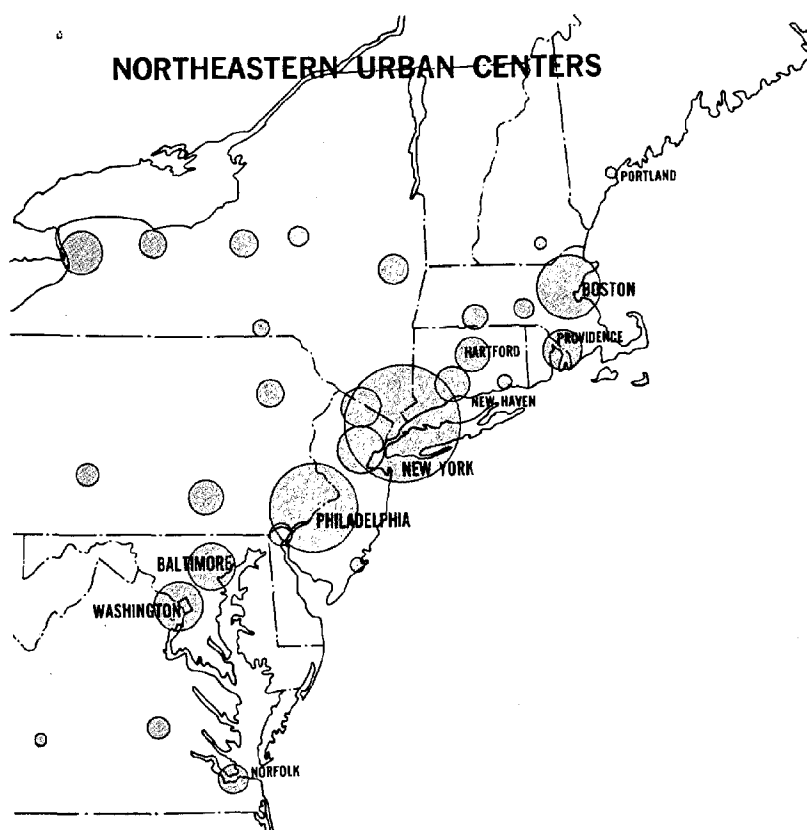


Figure 3.-- "BOSWASH": The northeastern urban centers.

Source: Regional Planning Council, Baltimore, Maryland, 1967.



Often the appearance is given that the objective achieved is worth the direct dollar-cost charged. In reality many external diseconomies are permitted, consciously or unconsciously. This "cheapness" is often an illusion that only now many are beginning to comprehend.

Throw-away containers are claimed to be better and more convenient for the customer. They really are more economically convenient for the manufacturer and the packager. For the consumer, such containers mean less product for higher cost since the container becomes a greater part of the cost with its once-only use.

The accumulation of more solid wastes means that we must pay for extra trash collection. Additional solid wastes from all of society require larger and larger disposal sites. Valuable marsh land is often buried and we lose what may be a convenient and increasingly necessary backyard recreational area. Marshes provide nursery grounds for valuable finfish and crabs as well as habitat for ducks, geese, railbirds, and other wildfowl; they may also play an important ecological role in utilizing nutrients from sewage waste water and land run-off, thus possibly serving as a buffer in preventing or delaying eutrophication problems in waterways. We cannot afford to waste resources in catering to the "convenience" of throw-away containers.

"Live better electrically", the slogan that encourages the wasteful use of electrical energy and such marginal products as electric toothbrushes, electric knives, and automatic bed-bouncers, can create thermal pollution problems in aquatic systems. There is an inordinate release of waste heat pouring from steam electric stations to our waterways today: for every kilowatt of electricity produced there are two kilowatts discharged as waste. Steam electric station operations can result in a number of external diseconomies ranging from atmospheric problems to shellfish contamination due to heavy metal losses from metallic heat exchange surfaces. Electricity is not as cheap as we think.

A new economic -ecologic philosophy will require that all cost-benefits to society be considered, including environmental values and a combined quality of air, soil, and water that permits an optimum life support system. Unchecked exploitation and degradation must be halted if man is to reach his full evolutionary potential. Society must strive for an environmentally attuned technology and accept any initial dollar costs necessary to achieve it. Proper planning will take major decisions that may have an impact on the environment out of the hands of independent private interests; mesh all decisions within a regional ecological framework; and will permit a wiser and more efficient utilization and recycling of our resources.

Proper regional planning should permit resource use, protection, and development only if it is for the overall public good. The best decisions will depend on our ability to assess all costs and benefits that are pertinent to society and our environment. To properly weigh the impact of our decisions we must greatly improve our ecological information. We must be able to quantitatively evaluate the environment and determine its potentials and vulnerabilities with regard to man's encroachment. Thus, research must carry a major load in this economic-ecologic process, especially in our present learning period. There are many alternative decisions available to us with regard to industrial and domestic developments and operations. Site locations; engineering designs; the extent of physical alteration really necessary to meet stated objectives; the quantity and quality of waste production; and many other aspects have not been properly explored from an ecological viewpoint in the past by local decisions makers.

Full fresh water conditions exist in upper tidal reaches, while a full marine environment occurs at the Capes where salinities may exceed 30 parts per thousand. Because of the original physical, chemical, and biological characteristics of the Bay, society has utilized this environment in a wide variety of ways, including domestic use for commercial and recreational shellfishing and finfishing; boating; sailing; water sports; and as a receptacle for sewage wastes. Industrial uses include shipping and the use of water for process purposes and the dilution of various waste material. Dredge and fill operations are accelerating due to land development pressures and the need to deepen and maintain shipping channels.

Space and time will not permit documentation of all the independent decisions that were made to meet limited and often short term objectives; however, a few examples will serve to illustrate the ecological consequences of certain decisions that resulted in environmental changes to the system: environmental changes that were probably not considered or properly evaluated when the projects were approved.

To help meet electricity requirements a series of hydroelectric dams were built on the mainstem Susquehanna River, the major tributary stream of the Bay. American shad (Alosa sapidissima) is an anadromous fish that migrates out of the ocean to non-tidal freshwater spawning grounds. It was an important food item in the early history of the United States. In the Bay system the Susquehanna served as the major spawning ground for this species. Since the dams were built, shad migratory activity has been blocked and population numbers of this highly delectable food item have been greatly reduced in the Chesapeake.

In 1829 the Chesapeake and Delaware canal was completed. At the time it contained locks and had a controlling depth of 8 feet. In response to shipping interests it was changed to a sea level canal without locks in 1927. In 1939 it was enlarged to a depth of 27 feet and width of 250 feet. Enlargement to a depth of 35 feet and width of 450 feet was authorized in 1954 and is now underway (Cronin, 1970). As a consequence of these operations a net flow of water now passes from the upper Chesapeake to the Delaware Bay.

Present salinity patterns in the Chesapeake are chiefly controlled by freshwater inflow from the Susquehanna. The physical nature of the Bay combined with the freshwater inflow causes a (primarily) two-layered system, with a less dense fresher body of water flowing seaward and a greater density body of water of oceanic origin actually flowing upstream in the deeper portions of the Bay. The net flow is, of course, towards the ocean. Biological organisms have uniquely adapted to this interesting, but relatively harsh environment. Various species show energy flow into useful foodstuffs through amazingly complex daily and seasonal variations in their use of the horizontal and vertical environmental gradients that occur.

The present widening and deepening of the C & D canal will result in an additional flow of 1,650 cubic feet of water per second from the upper Chesapeake to the Delaware (Cronin, 1970). The economic benefits to the shipping industry are easily measured and justified by the canal alteration; these benefits were the only major considerations in the decision. The environmental alterations and consequent ecological changes as a result of this decision are only now being discussed.

As a result of earlier biological research it was learned that the striped bass spawns at the regions of upper salt intrusion in the Bay system (Figure 4). These areas combine to make the Bay the major spawning ground for this species on the east coast of the United States. Recent field research on fish eggs and larvae (Dovel and Edmunds, 1970) has demonstrated that striped bass have apparently abandoned their old spawning site on the lower Susquehanna and now utilize the C & D canal and its approaches very successfully. The present question is whether increased water flow towards the Delaware will interfere or enhance present spawning success.

With regard to the Bay proper, the question of loss of freshwater flow and possible increased salinities arises. Increased Bay salinities can occur from freshwater diversion in non-tidal segments of the watershed or from increased flow of water from the upper Chesapeake to the Delaware by additional widening and deepening of the C & D canal. Will the Bay salinity change be significant, and if so, what will be the ecological consequences? Will oyster predators and diseases that are now confined to the lower Bay in higher salinities begin to encroach into the productive low salinity oyster grounds in Maryland and thus eliminate Maryland as the major oyster producing state in the Union? These environmental trade-offs are only now being considered: can they be evaluated? It is interesting how the discovery of oil on the north slope of Alaska can lead to a series of independent decisions that result in supertankers, C & D canal alterations, and a changed Bay ecology.

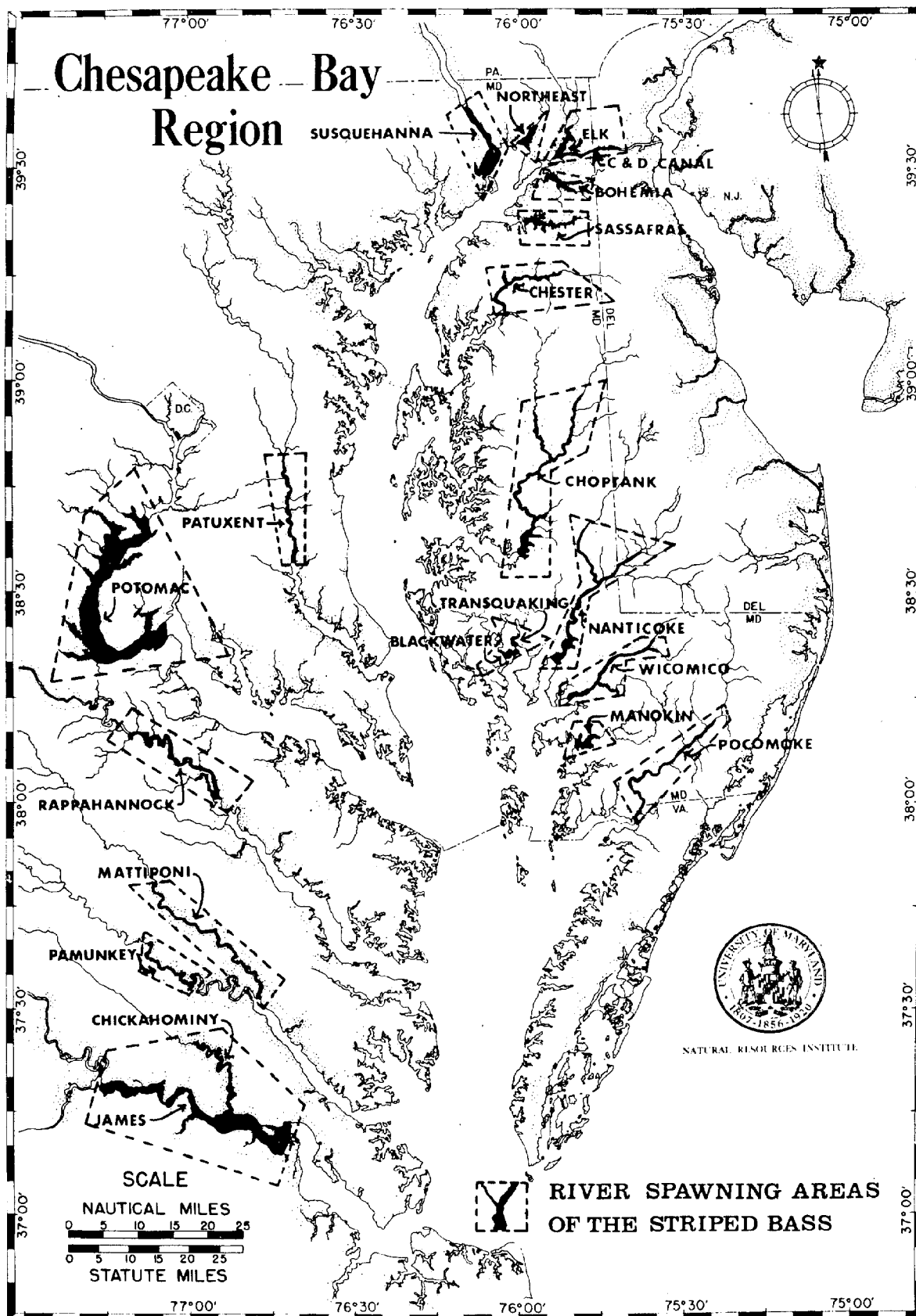


Figure 4.-- A map of the Chesapeake Bay region showing striped bass spawning areas (after Mansueti and Hollis, 1963).

Because of their increasing size and need for greater volumes of water for cooling supply, steam electric stations (S.E.S.) are rapidly being located in coastal regions. Estuaries and marine coastal waters provide the water volume required and areas for the dissipation of vast quantities of waste heat. Research on conventional fossil fuel S.E.S. has demonstrated that when site selection and engineering designs are made without due consideration of environmental needs, a number of environmental trade-offs or external diseconomies can occur. Temperatures can be elevated above the tolerance of resident species and kills can occur. Chemicals, such as chlorine which is used to keep heat exchange surfaces clean, act as a biocide and can kill useful organisms. Erosion and/or corrosion can result in loss of heavy metals such as copper to the water. Biological "concentrators" such as oysters can accumulate these heavy metals in their body tissues and be rendered unfit for human consumption (Roosenburg, 1969). Ecological considerations must include the effects of heated water discharge on useful resident species and the fate of organisms entrained in the cooling water supply passed through the S.E.S. (Figure 5). These entrained organisms consist of microscopic plant life or phytoplankton; zooplankton, or phytoplankton consumers; shellfish eggs and larvae; and finfish eggs and larvae. Survival of these species is necessary for the continued productivity and utility of the Bay proper. Our studies of these organisms have documented up to 95 and 100 percent destruction upon passage through a S.E.S. cooling system under certain seasonal and engineering design conditions (Mihursky, 1969; Heinle, 1969; Morgan and Stross, 1969).

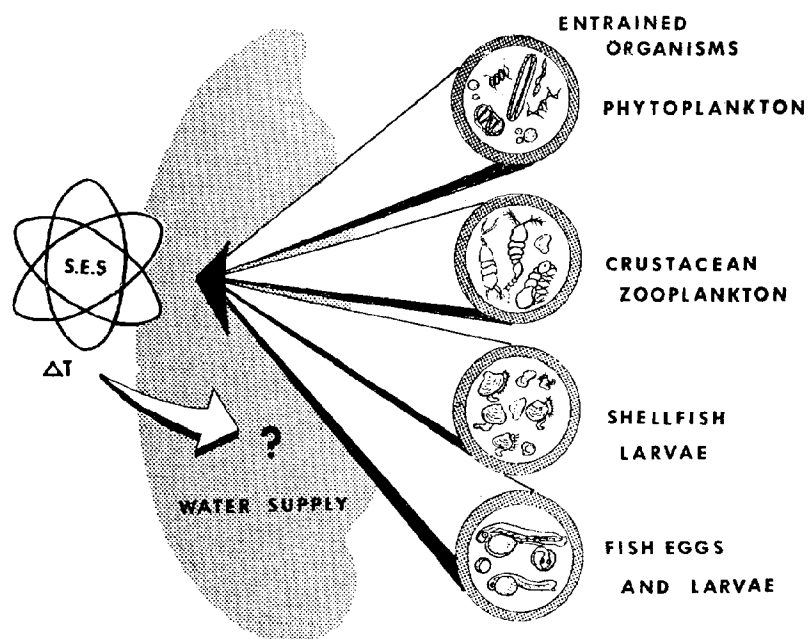


Figure 5.-- Some organisms and life history stages that may be entrained in a cooling water supply of a steam electric station (S.E.S.).



The above practical field experience has been coupled with laboratory data and general ecological knowledge of the complexities of the Bay to assist future decisions concerning S.E.S. site selection and design. In essence we are using ecological data to assist regional planning decisions with regard to S.E.S. in order to minimize environmental damage.

Recommendations were made for regulatory changes on water temperature standards to the Maryland Department of Water Resources (Mihursky, 1967; Mihursky and Cronin, 1967). Figure 6 presents temperature tolerance data for a variety of estuarine organisms and shows the maximum and minimum tolerance with season as determined by a standard pharmacological assay method. Maryland's temperature standards have been reduced for the old permissible level of about 100<sup>o</sup> F. for any season to certain lower seasonal maxima that reflect research information. Mihursky (1969) gave a series of recommendations that were aimed at State regulatory agencies and industry. In a report section entitled Maryland Standard Operating Procedures for New S.E.S. Sites the following points were made:

1. Requirements of the aquatic resources should be given high priority in S.E.S site selection.
2. Certain areas can be identified where S.E.S. should not be permitted. Although these areas will be more adequately identified as more information becomes available, the following localities should not be subjected to degradation:
  - a. Those that support or have the potential to support significant stocks of useful shellfish such as oysters.
  - b. Those that carry abundant quantities of eggs and larvae of finfish and shellfish important to the economy and ecology of the Bay, such as the striped bass spawning grounds at the salt-freshwater interface in the upper estuarine reaches.
  - c. Those bottle-neck areas, through which migratory stages of important species must pass.
3. S.E.S. should be prevented from locating in areas of restricted water supply or circulation.

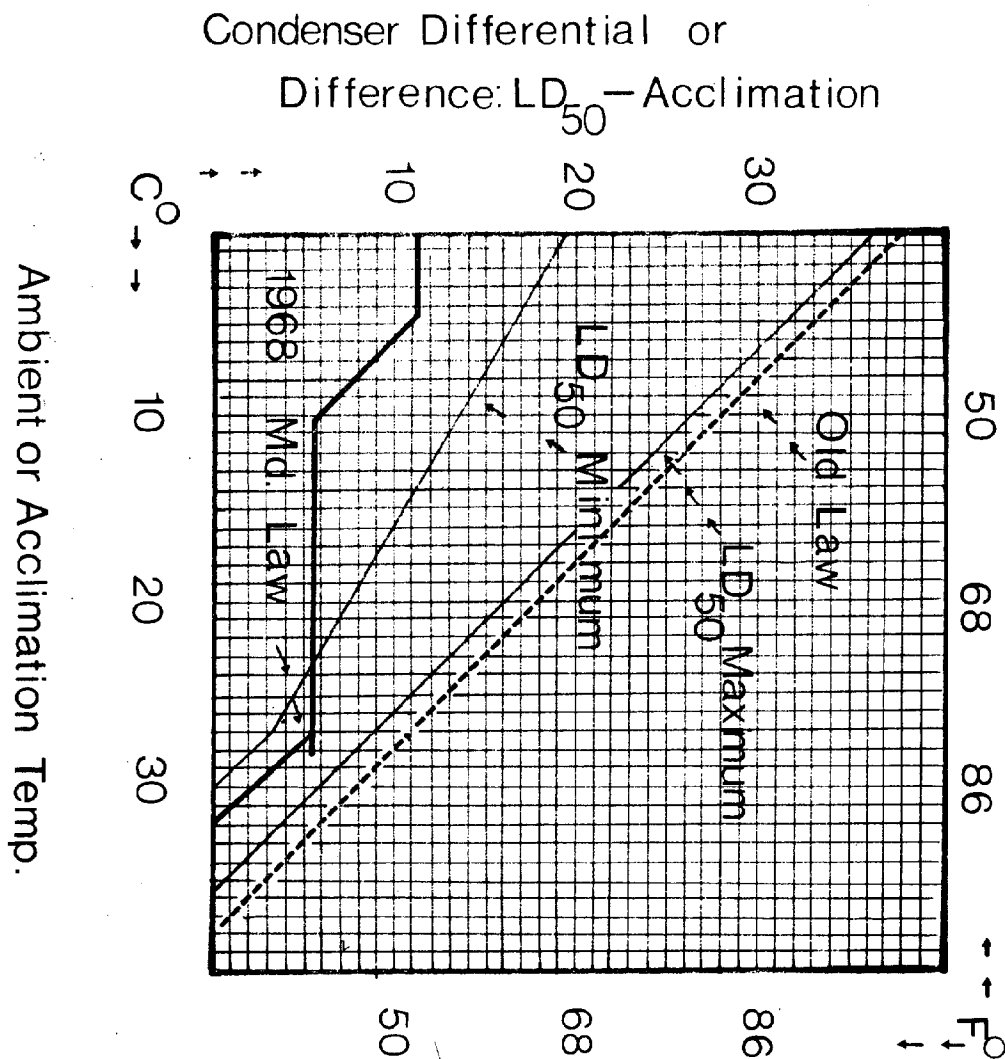


Figure 6.-- Summary of laboratory  $LD_{50}$  testing on estuarine organisms. Individual lines have been omitted and only the extremes (minimum and maximum) plotted. The "old" and "new" (1968) Maryland law are plotted. Note that under existing legislation, most organisms now seem to be better protected over the major portion of the ambient temperature range.

4. Waters of low biological productivity or poor water quality should receive primary consideration for S.E.S. use. Treated sewage water, acid mine water, other already polluted areas that will not be restored in the immediate future and the deep, low oxygen water of the central Chesapeake during the summer months are examples.
5. Before final decision is reached on any proposed S.E.S., an adequate survey of existing aquatic resources must be undertaken and reasonable estimates provided on effects of the proposed installation on the local ecology. Competent post-operational monitoring on the key aquatic resources must also be undertaken at the site.
6. Effective mechanism for continuous review and improvement of the State's regulations and research programs relating to thermal additions will be required throughout this period of rapid expansion by the industry.
7. The State must maintain its research expertise in order to evaluate effects of present and proposed environmental changes of its natural resources. The State's studies in the Patuxent were coincident with a large program by consultants employed by the power company. If the State had been entirely dependent upon industry and their consultants to measure, evaluate, and report upon the changes and effects upon the estuary, there would have been little or no useful information available on:
  - a. the effects on the organisms and the ecology of the estuary;
  - b. the proper basis for water quality standards for thermal additions to estuaries;
  - c. the vulnerabilities and potentials of estuaries for industrial operations requiring process water; or
  - d. the biological basis for improvement of the process of selecting and evaluating possible industrial sites.
8. If S.E.S. size continues to increase, and damage to entrained organisms or other biota cannot be prevented, serious consideration should be given to prohibiting S.E.S. sites in the Bay region.

What has been the overall consequence to the Bay region as a result of ecological research activity, and interactions with the State regulatory agency and industry?

Figures 7a and 7b are schematic illustrations of water intake and discharge arrangements of two S.E.S. on tidal arms of the Bay, and show temperature elevation patterns and transport time of cooling water from point of intake to point of discharge into the estuary. Scheme one (7a) reflects an old design (built in the early 1960's) that has summer temperature elevations across the condensers of  $11.5^{\circ}\text{F.}$  and a transport time from intake to discharge in the estuary of 2.7 hours. Discharge temperatures nearly reached  $100^{\circ}\text{F.}$ , within the old water quality standards of the State. The cooling water intake is located in a relatively shallow shelf zone. This installation uses chlorine to keep heat exchange surfaces clean. Scheme two (7b) is the design of a new plant by the same company. Intake water is from cooler deeper zones (30-50 feet) and water transport time is 1.5 minutes from intake to the estuary. Cool, normal estuary water is also added immediately on the discharge side of the condenser. Maximum temperature differential between intake and outfall water is designed to be  $10^{\circ}\text{F.}$  and the summer discharge maximum is designed to be approximately  $90^{\circ}\text{F.}$ ; this is about equal to the maximum reached by surface waters in the Bay under natural conditions. The above conditions, except when discharge temperatures might exceed  $90^{\circ}\text{F.}$ , meet the new state water quality standards. In addition, condenser cleaning is to be achieved by using sponge rubber balls forced through the cooling system. As to effects on entrained organisms, it would appear that scheme two is an improvement over scheme one, but field testing must still be accomplished.

Figure 8 is a cross section of the Chesapeake Bay and shows the existing temperature isotherms for a summer day. Notice that the hottest temperatures occur at the surface and on the shelf zone.

# CHALK POINT

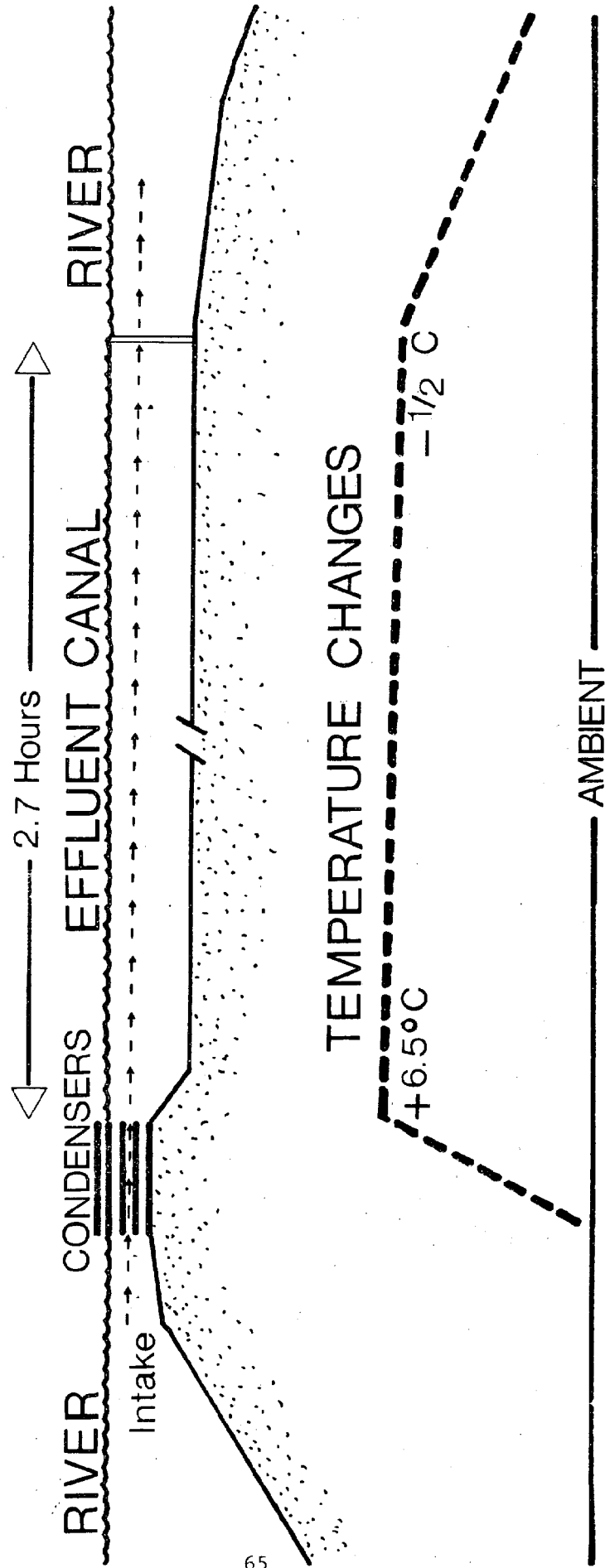


Figure 7a.-- Plant designs of S.E.S. in Maryland tidewater. Notice differences in intake and discharge methods, and in transit times through the installations.

# MORGANTOWN

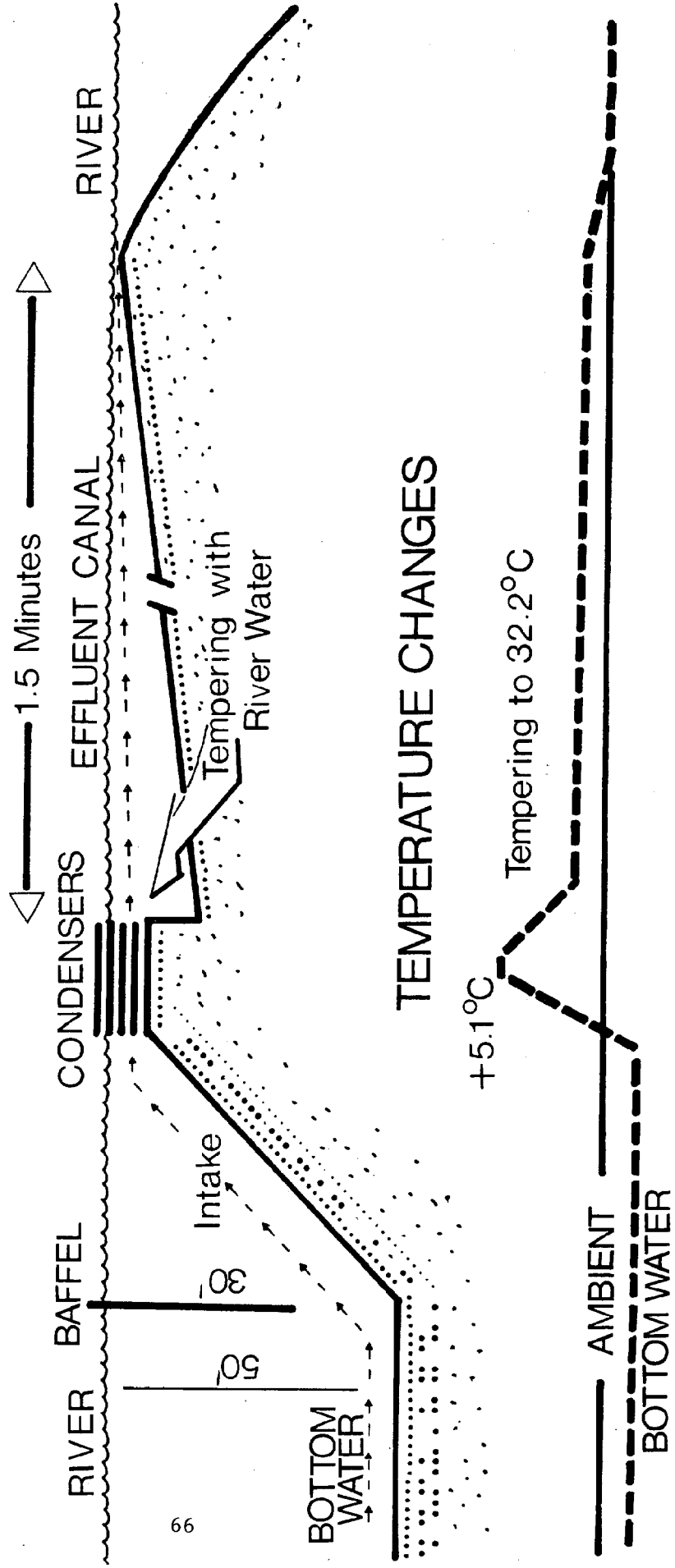


Figure 7b.-- Plant designs of S.E.S. in Maryland tidewater.

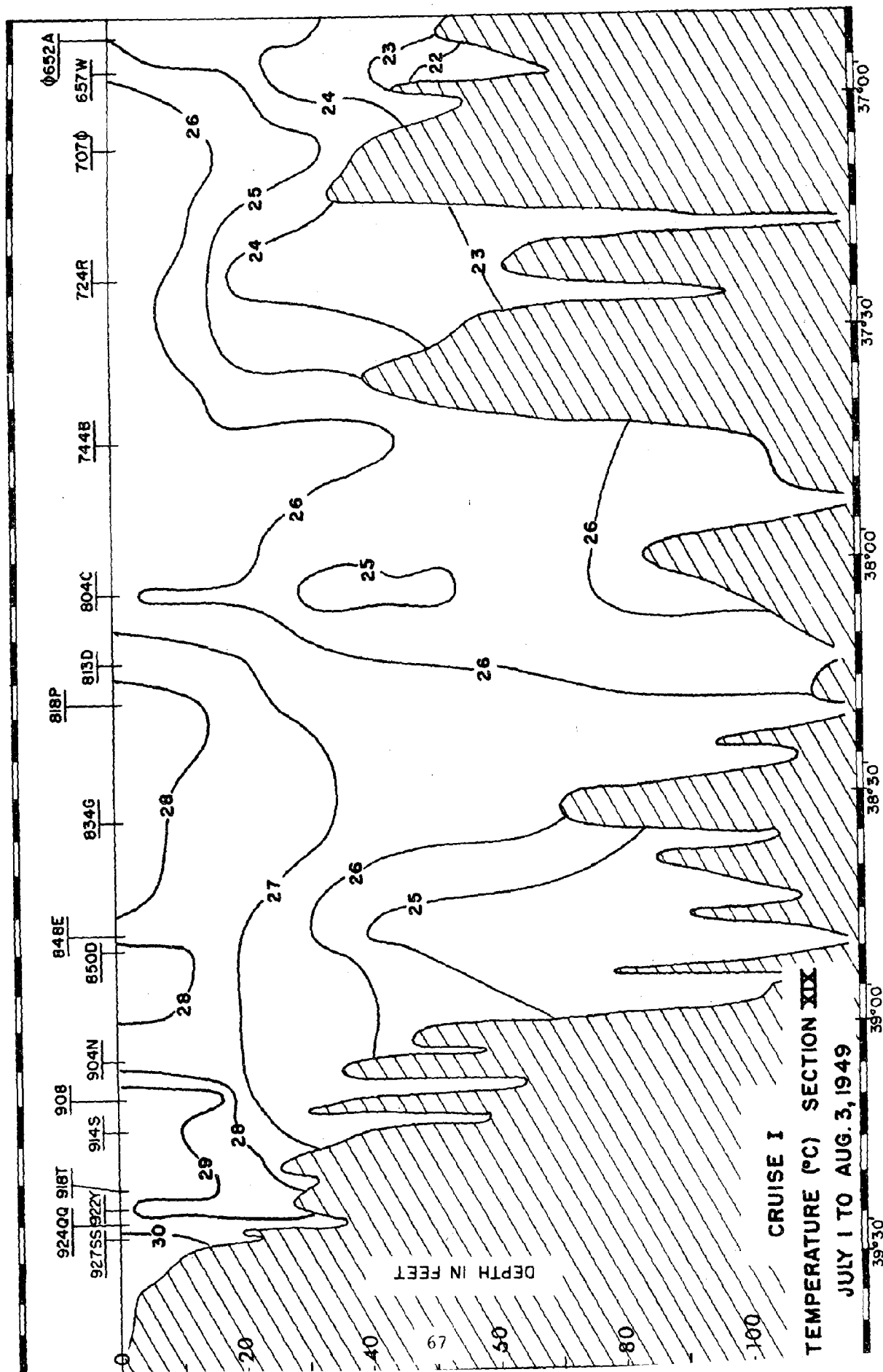
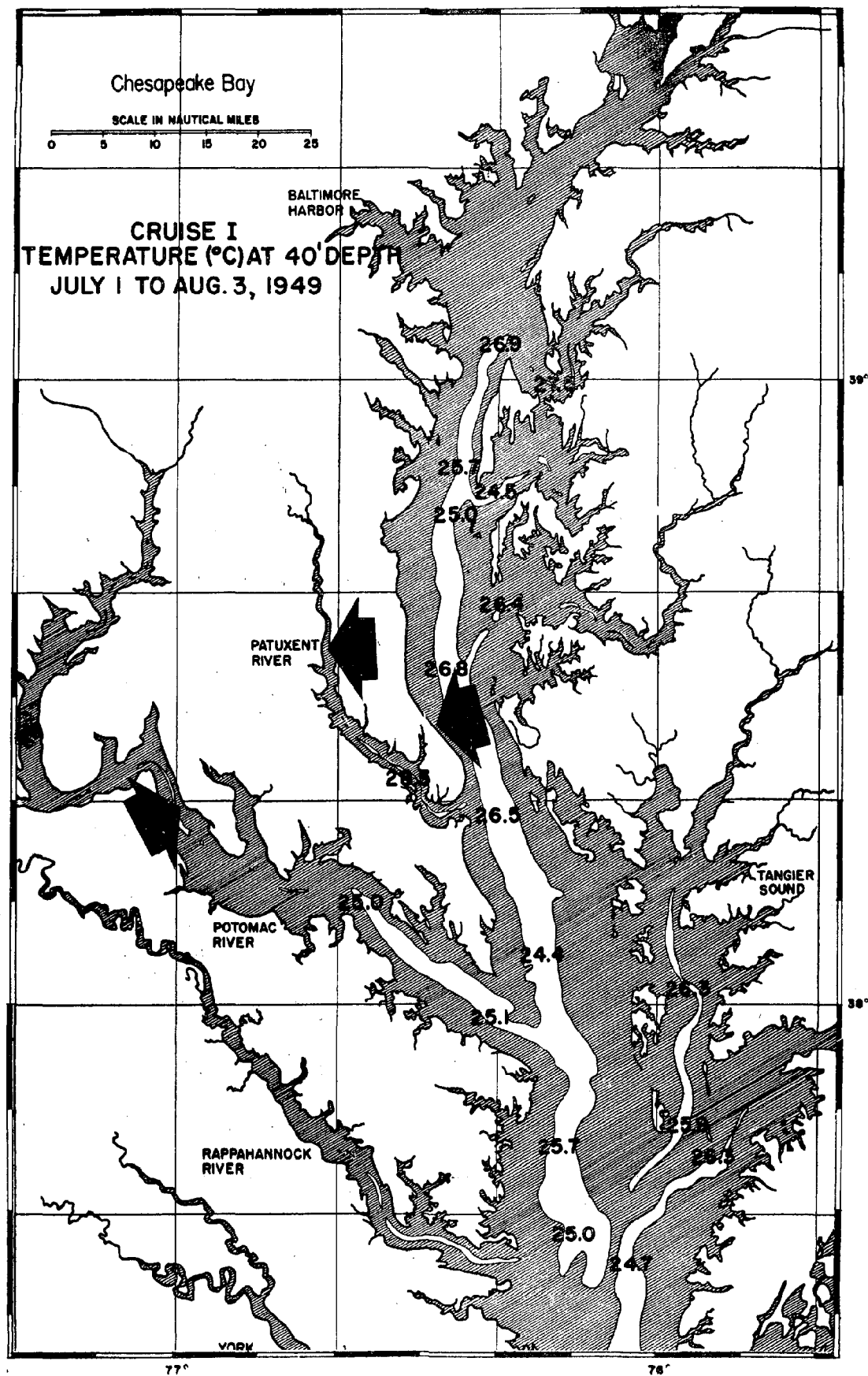


Figure 8.-- Cross section of the Chesapeake showing various temperature contours (after Whaley and Hopkins, 1952).

S.E.S. typically pump cooling water from this shallow shelf zone; the zone that naturally is the hottest during the summer. A number of important animal species in the Bay, such as the soft shell clam, are at the southernmost limit of distribution on the east coast. Their southern distribution appears to be limited by high natural temperatures, and any relatively small heat addition can therefore have detrimental effects on these species. It has been observed that below about 40 feet in depth the Bay system between Annapolis and the mouth of the Rappahanock (Figure 9) tends to become deficient in oxygen during the summer, and as a result probably contains fewer organisms than surface waters. Waters from these depths, therefore, may possibly be useful as an industrial cooling water supply in summer. A new nuclear S.E.S. is locating in the Bay midsection (Figure 9, arrow) and will pump in a cooling water supply from a depth of 28 to 40 feet. This same installation will also have a short intake-discharge passage time (about 4 minutes) and will use sponge balls for cleaning condenser tubes instead of chlorine. A number of design decisions, therefore, have been made that reflect a certain awareness of and response to environmental vulnerabilities and flexibilities.

However, we are not "home free" by any means in maintaining environmental quality in the Bay region. Cronin and Mihursky (1970) have recently emphasized areas of ignorance with regard to nuclear S.E.S. operations on Bay ecology. The field of ecology is gaining in sophistication and is developing predictive models with regard to proposed environmental modifications. Figure 10 is one such thermal-biotic predictive model for an estuarine system developed for use in the Chesapeake Bay. The model presents optimal and sub-optimal summer temperature levels for the Bay animal community.





# THERMAL-BIOTIC PREDICTIVE MODEL for an ESTUARINE SYSTEM

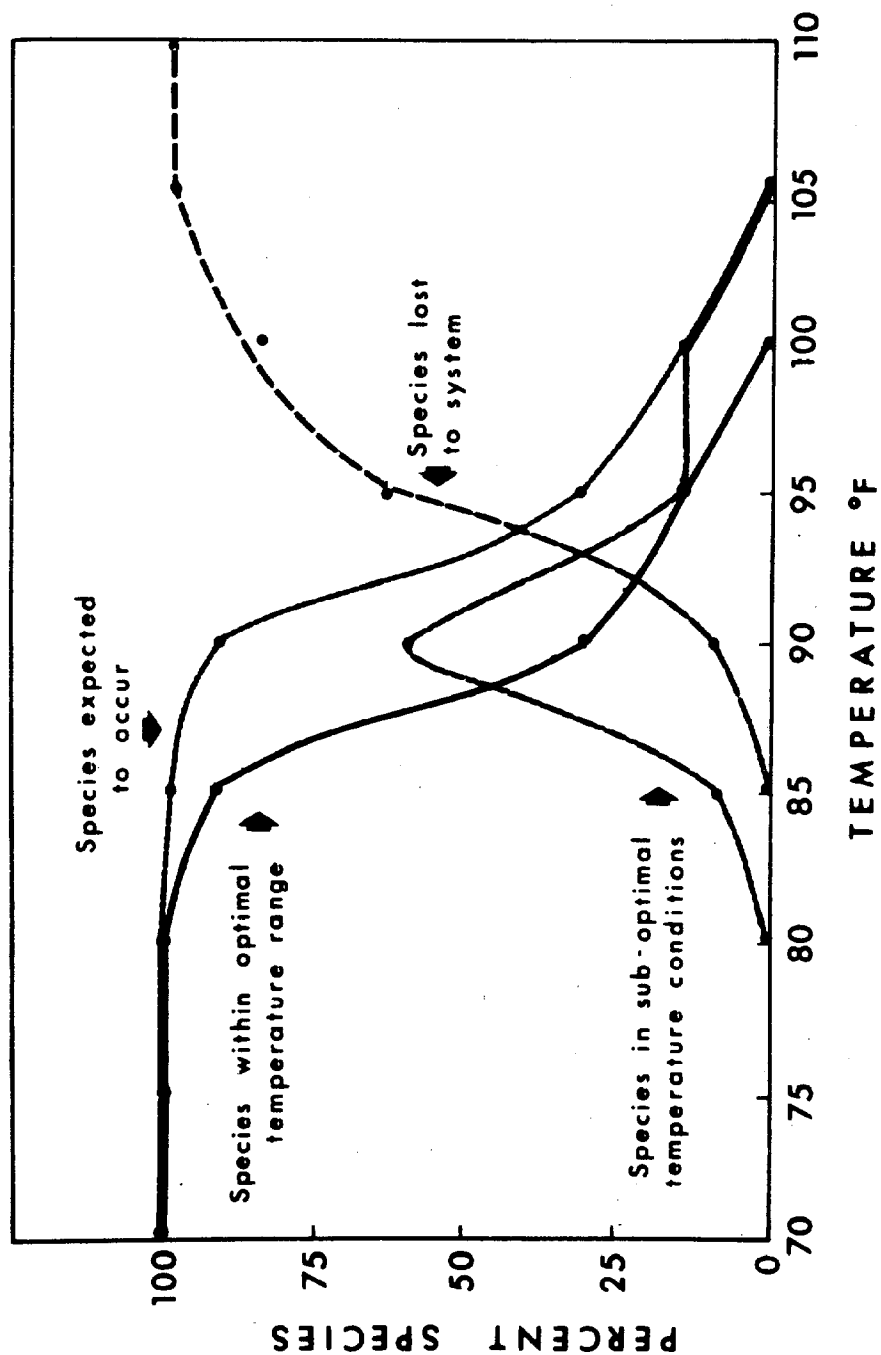


Figure 10.-- Thermal-biotic predictive model for an estuarine system (summer conditions).

Figure 11 presents a model that describes the flexible temperature zone existing for Bay species for the various seasons. The maximum allowable temperature elevation line (M.A.T.E.--dotted line) indicates the maximum increase in temperature that will still permit optimum functioning and production of the Bay ecosystem throughout the year. These are unpublished, first models, but do indicate what can be done to provide useful ecological information.

In addition to changes in water quality standards the State government is altering the entire sequence of decisions on S.E.S. siting and operations. Site selection, land and water use, engineering designs, and other decisions are now being made within a concept of regional planning. Facility construction will not be permitted to start until all industrial plans are approved by pertinent State agencies.

New Bills are still being submitted to the State and the Federal governments to improve controls for the overall public good. Maryland State delegates Goodman, Fornos, and Dypski introduced a bill entitled Maryland Environmental Research Program and Electric Power Plant Siting Act of 1970 (House of Delegates Bill, 1145). The main objective of this Bill was to place a 0.5 mil surcharge tax on every kilowatt hour of electricity generated in the State. The money obtained could amount to \$10 million per year, and would be used for ecological research, engineering research, and land and water use studies that would enable proper S.E.S. site selection and design decisions to be made from a regional planning approach.

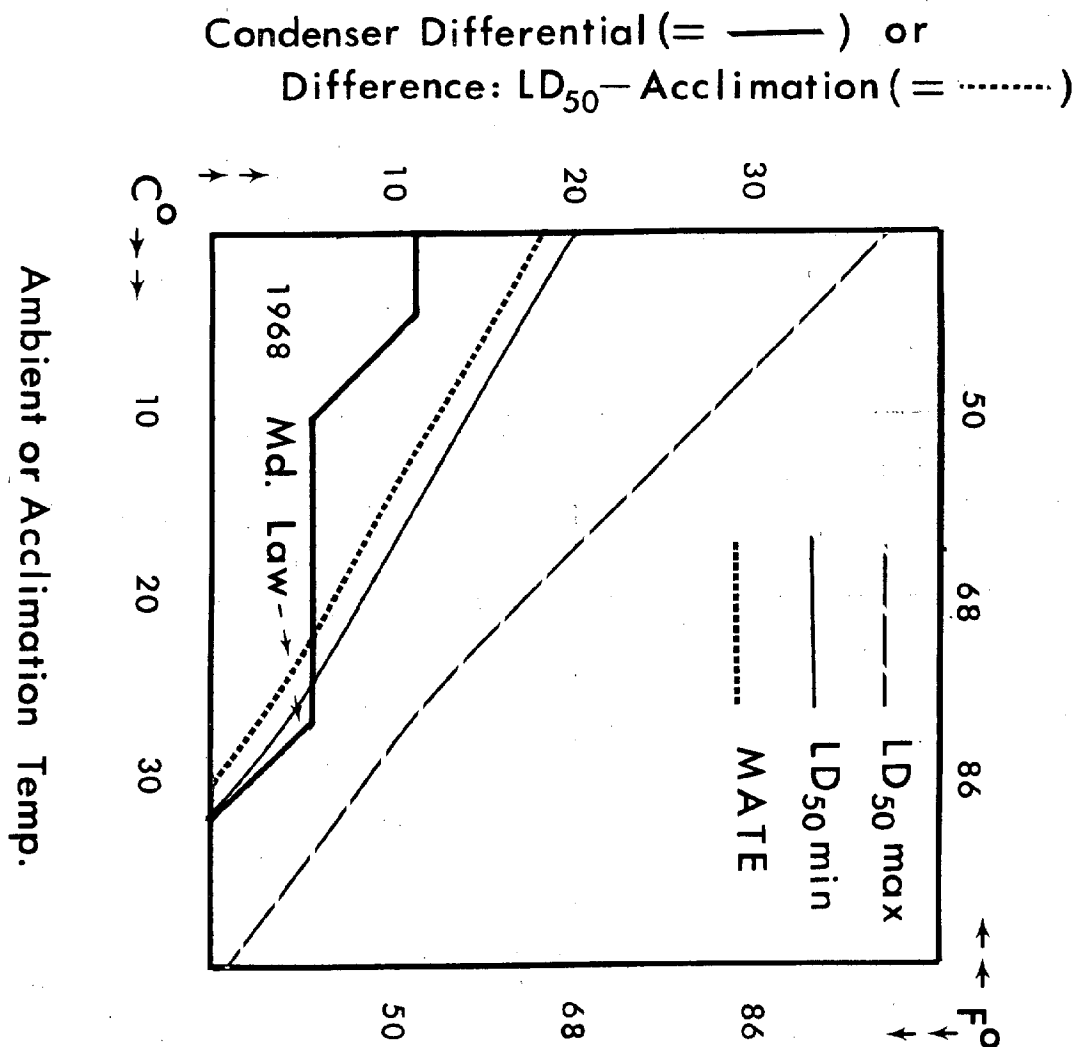


Figure 11.-- Application of the predictive model. The dotted line, M.A.T.E. (maximum allowable temperature elevation), is an extrapolation that is more conservative than the LD<sub>50</sub> minimum line, and is suggested as an ecologically safe level of temperature change that might be permissible throughout the various seasons.

Senator Muskie introduced Senate Bill S-2752 entitled Intergovernmental Coordination of Power Development and Environmental Protection Act to the first session of the 91st Congress. The objective of this Bill is to "promote intergovernmental cooperation in the control of site selection and construction of bulk power facilities for environmental and coordination purposes."

Research agencies, industry, state agencies, and State and Federal legislators are beginning to respond to environmental needs which are really society's needs. It is quite clear, however, that the job is massive and complex. Rhetoric and "gut" appeals will not accomplish what is needed. What is required is an environmental "NASA" concept: a heavy outpouring of funds, manpower, and coordinated research and management effort in every sector--public and private. Our developing national ecological conscience will demand no less than this.

This paper is Contribution # 438 of the Natural Resources Institute of the  
University of Maryland

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PLANNING FOR COASTAL ZONE MANAGEMENT BY NASSAU AND  
SUFFOLK COUNTIES OF LONG ISLAND

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The many excellent papers already presented to this conference, and the fact that the New England Council has felt the need to sponsor a conference on "Coastal Zone Management" is ample evidence of the increasing awareness in this country and throughout the world of the need for developing proper management procedures for the marine resources of the coastal zone area. This need has long been recognized on Long Island, where citizens are all very close to the marine edge. The need was brought into focus when the Nassau-Suffolk Regional Planning Board was established in 1965 under the General Municipal law, State of New York, Article 12B. The purpose of the Board was to develop an overall plan for the best multi-purpose use of the resources of the bi-county area in terms of the requirements of all actual and potential users. The Planning Board is presently studying bi-county needs and formulating a master plan that considers uses of the land such as transportation; housing; recreation; industry; commerce; education; and any other uses deemed reasonable now or in the foreseeable future. To develop the methodology that would allow the Planning Board to consider realistic plans for the use of the marine resources in conjunction with the development of the overall master plan for the land area, a primary requirement was (and is) to understand the problems arising from the use of the marine resource. Consequently, the Planning Board established an Oceanographic Committee in June 1965 (as a first step) to study the impact of our rapidly expanding population on the marine resources of Nassau-Suffolk.

A number of problems were identified by the Committee in its report, The Status and Potential of the Marine Environment. This report documented the present economic value and the future potential of the marine resources of Long Island; both the direct commercial aspects and the more subtle non-commercial indirect aspects were considered. If Long Island is to grow as a desirable and attractive place in which to work and live, the present trend toward the deterioration of the estuarine and shore environment must be reversed. The report identifies factors such as dredging, land fill, and pollution by human, industrial, and agricultural wastes leading to environmental degradation. The report also noted the need for a much greater knowledge of the marine environment before such problems can be solved, and recommended that the Planning Board set up the Regional Marine Resources Council (MRC) to pursue a research program to obtain this knowledge and advise the Planning Board on all matters concerning the marine resource. The Council was established in April 1967 and has been active in pursuing these objectives since that time. The Council consists of a chairman and 16 appointed members: 8 from Nassau County and 8 from Suffolk who represent leadership in education; conservation; agriculture; boating; fishing; shellfishing; other marine related industries; and local government. In addition the Council has invited representatives of Federal, State and County agencies to serve as technical advisory members. Members presently include representatives of the U. S. Army Corps of Engineers; the U. S. Department of Interior's Fish and Wildlife and National Park Services; the U. S. Geological Survey; the Coast Guard; the New York State Office of Planning Coordination; the New York State Department of Environmental Conservation's Division of Marine & Coastal Resources and Water Resources Board; and the Nassau & Suffolk County Departments of Health, Planning and Public Works.



The bulk of the problems common to all coastal zone areas seem to arise from the effect on the environment of the activities of man, particularly in areas of high population density, or as the result of natural phenomena that have an adverse effect on various human activities. Examples of this latter type are the problems of beach erosion and stabilization, where storms may destroy man-made structures such as houses, boat-yards, and so forth with resultant economic loss; the shoaling of inlets, of channels through the littoral drift along the coast; and the growth of aquatic plants. While the existence of such phenomena is well known, there are still some gaps in our knowledge as to the best way (if any) to prevent them. In fact, the best, all-encompassing use of the marine resource might be not to fight such natural forces but to accommodate them. In the case of human activities adversely affecting the environment, we have problems such as the destruction of wetlands by fill from dredging for real estate development, by dumping of wastes, or by sand and gravel mining operations. It is generally agreed that wetlands are a requirement for continuing and abundant marine life such as shellfish, crustaceans, and finfish both for commercial and recreational purposes. Wetlands also serve in the preservation of wildfowl and other forms of wildlife, both for their esthetic values as well as for hunting and other recreational purposes. However, it is certainly far from clear the amount of wetland areas that are required or whether there are ways of enhancing the productivity of wetlands by various forms of cultivation, so that some of the less productive areas could be developed or used for other purposes.

Currently, at the western reaches of Long Island's marine areas (which are typical of a marine shore interface where an essentially urban culture exists) probably the greatest problem is that of pollution from various man-made sources and disposal of wastes. We need to know how much sewage of industrial waste the various areas can handle and how it must be treated to be safe for fishing, for swimming, or just for pleasant boating. Are there other ways of handling it? Is some of it beneficial? The same questions arise in connection with the location of power plants and other installations discharging heated water.

On eastern Long Island, there is more of a problem from farm runoffs of pesticides; herbicides; and fertilizers; their effects on algal growth; and the resultant effect on fish and other wildlife. We need to dispose of the considerable deposits of organic material from duck farms that have depleted the oxygen in the creeks; are responsible for disagreeable odors and other unaesthetic aspects; and cause the destruction of potentially productive fish and shellfish areas. The great variety of the marine environment of the 1,000 miles of Long Island's shoreline and the many conflicting demands for its use (including the conflict of the varying jurisdictions of over 100 different governmental entities) pose an extremely complex problem; the knowledge needed for its solution is incomplete and inadequate.

The Marine Resources Council (MRC) is presently engaged in a research project to develop a methodology and the knowledge necessary for the best management of the marine resources of Long Island. The major part of the research program has been carried out by the Center for Environment and Man (CEM), formerly the Travelers Research Corporation under a contract with the MRC. Originally the work was supported solely by the two counties, but in September 1969 the MRC received a grant from the Sea Grant Office of the National Science Foundation for funding the CEM contract.

The research program with CEM has been structured into the following series of functional steps:

- (1) To understand the problems associated with the marine resources of Long Island;
- (2) To identify the knowledge necessary for making sound decisions with regard to Long Island's marine resources;
- (3) To identify the availability, reliability and applicability of existing knowledge and data;
- (4) To determine necessary data collection and research activities;
- (5) To collect required data and perform necessary research; and
- (6) To develop a system for organizing the knowledge and data for providing information to marine resource planners.

The effort to date has been an attempt to identify and describe the problems associated with Long Island's marine resources; to determine the knowledge needed to plan for solutions to the problems; and to determine the state of our knowledge. The CEM work is contained in the reports on Functional Step One, Functional Step Two, and Fourteen Selected Marine Resource Problems on Long Island. The ultimate goal of the effort to develop a system for management and planning is a computerized information system that will contain the data, knowledge, and techniques that will enable the managers of marine resources to:

- (1) Predict environmental conditions in space and time as they are influenced by causal factors;
- (2) Assess the effects of environmental conditions on marine related activities;
- (3) Assess and evaluate the economic and social costs and benefits of such conditions and activities; and
- (4) Select combinations of activities and conditions which best meet the needs of the people in terms of marine resource utilization.

The attainment of these objectives would provide the information that is required for the best planning and management of Long Island's marine resources.

The total development of the information system described here will take a long time. It is not wholly attainable within the present state of our knowledge. But the design does provide a blueprint early in the program for:

- (1) Identifying research needs;
- (2) Identifying data collection needs;
- (3) Structuring data storage and retrieval;
- (4) Formulating the steps in management decisions for different classes of problems; and
- (5) Synthesizing all of the above into a comprehensive management system.

We hope that the methodology will be sufficiently developed by 1971 so that it can be applied to problem areas where there is already sufficiently developed knowledge for meaningful planning.

We believe that our work, while being developed in terms of planning for Long Island, will be sufficiently broad to be applicable to areas other than Nassau and Suffolk Counties. It most certainly will be highly pertinent to the northern reaches of Long Island Sound. We hope that we can work with other agencies to plan for the management of Long Island Sound as a whole. In the meantime we anticipate that others interested in Coastal Zone Management will be able to make use of the results of our program as the reports on the various steps become available.

#### Literature Cited

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3. Functional Step Two: Knowledge Requirements. TRC Report 4047-387, prepared for Marine Resources Council.
4. Fourteen Selected Marine Resource Problems of Long Island, N.Y.: Descriptive Evaluations. TRC Report 7722-377, prepared for Marine Resources Council, January 1970.
5. Quality Standards for the Coastal Waters of Long Island. CEM Report 4047-408, prepared for Marine Resources Council, April 1970.

The above reports are presently available from the Marine Resources Council, Nassau-Suffolk Planning Board, Hauppauge, Long Island, New York 11787.

A SUGGESTED APPROACH TO COORDINATED PLANNING AND ACTION FOR  
CONSERVATION AND DEVELOPMENT OF THE COASTAL ZONE

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The future character of the New England coastline will be determined in large measure by decisions made over the next few years.

Coastal lands and waters are under intense pressure for a variety of uses, including:

- (1) port, harbor and navigation facilities;
- (2) industrial activities, including thermal power generation; plants, oil refineries, minerals processing and extraction, and others;
- (3) solid waste disposal and other landfill;
- (4) expansion of marine-related commercial activities;
- (5) outdoor recreation and tourism;
- (6) residential development, including both permanent and seasonal homes;
- (7) preservation of coastal marshes, scenic and scientific areas; and
- (8) production, protection, and harvest of fisheries and wildlife.

In addition, it seems likely that the immediate future will see an expansion of the rate of demand for coastal resources. The exploitation of offshore petroleum deposits would, for instance, generate demand for onshore service, storage, processing and distribution facilities.

To be effective, a program must be built on knowledge of the present uses of the coastal zone, on the capacities of the waters and lands to serve additional or different uses, and on the aspirations and needs of the people and institutions of the region. An effective program will make appropriate provision for accommodating the national interest in the coastal zone--out of such concerns as national defense, navigation, the preservation of unique scenic, scientific and recreational areas, and the national economy--as well as the public interest as defined in regional, state, local and private terms.

#### Apportionment of Responsibility

The River Basins Commission, as a Federal-State agency responsible for preparing a comprehensive plan for use and development of water and related land resources for the region, is the logical agency to provide regional leadership and coordination. The plan and program should constitute an element of the comprehensive, coordinated joint plan for use and development of water and related land resources which the Commission is required to prepare.

As a Federal-State agency with broad responsibilities for regional development, the New England Regional Commission should provide leadership in clarifying economic objectives as guidelines for coastal zone management. The New England Regional Commission may also appropriately assist in funding development of the plan and program under its own legislative authorities. The plan and program should also become an element of the overall economic development plan that the Regional Commission is required by law to prepare.

The strategy outlined in this paper assumes that the States have the prerogative to set goals and objectives for use and development of their coastal areas. (As used here, "State" includes political subdivisions.) State goals, objectives, and plans for use and development of the coastal zone should constitute the prime determinant of Federal as well as State and local programs; modified, however, by primary Federal jurisdiction relative to the national defense and navigation, and by the clear national interest in the New England coast as a resource region significant in many ways to all the people of the United States.

In representing the regional and national interest, Federal agencies should develop solid information on regional and national demands for use in formulating coastal water and land use plans by State, and should represent the national and regional interest in coordination of State plans into a regional plan and program.

Local, State, and Federal governments will share responsibility for public programs to implement the plans.

Private citizens and interests should be involved in all aspects of planning, and will bear a heavy share of responsibility for ultimate use of the coastal zone.

#### Program by Fiscal Years

##### Fiscal Year 1970

- (1) NERBC assigns professional staff, including a project coordinator, to the program. If full State and Federal support is received for FY 1970, NERBC can allocate two man-years of professional staff time in FY 1970.
- (2) Meetings are held to organize a regional approach for the program, including common goals, objectives, methods, and responsibilities; a task force of State and Federal officials to provide regional coordination is established, chaired by NERBC.



- (3) Each State organizes to lead in preparation of a State coastal zone plan, in accord with agreed-upon guidelines, with Federal and Regional participation through the task force. Each State hires or assigns a project coordinator to the program. Utilizing Federal planning assistance funds, assisted by NERC support, State planning is initiated. Major outputs: a statement of goals and objectives relative to the coastal zone; a rough inventory and classification of the coastal zone by potential uses; progress in extracting relevant data from other State and local planning efforts; and identification of major trends and conflicts.
- (4) Drawing on the North Atlantic Regional Water Resources Study (NAR) and other sources (see page 88 Relationships to Other Studies), the project coordinator and Federal agencies compile information on regional and national demands, on projected demands with NAR coastal regions, and on the status and recommendations of previous and ongoing Federal studies and surveys. (NERC funds would accelerate this process.)
- (5) A conference (or conferences) is held at an early date to announce the program; to stimulate public understanding and participation; and to elicit and present information on current and foreseeable problems, opportunities, and suggested solutions.
- (6) An interim report is issued at the end of the first year dramatizing major conflicts, choices, and possible solutions and recommending needed immediate actions under a title (descriptive) of The Outlook for the Coastal Zone.

#### Fiscal Year 1971

It will be essential in FY 1971 to make substantial progress in inventory and classification of resources in sufficient detail to permit formulation of draft State coastal zone plans. The level of additional funding required will depend on the availability of Federal and State funding for ongoing State planning programs through usual ("701" and others) channels.

Objectives for fiscal year 1971 might include:

- (1) Additional data on national and regional needs and outputs of ongoing Federal studies consolidated by project coordinator from Federal agency sources.
- (2) States complete compilation of information from State sources on resource capability, desired uses, State and local plans, and other pertinent data.

- (3) Each State develops, with Regional and Federal participation through the task force, rough draft plans for use of its coastal zone, including goals and objectives; status of resources and demands; criteria for evaluating use; recommendations on specific key areas; and methods of implementation.
- (4) State and Federal officials meet to consider gaps, conflicts, and duplications in draft State plans.
- (5) Public contact and participation are pursued.
- (6) A second interim report is issued, describing major elements of draft State plans, and again recommending immediate actions. (Detailed planning and immediate action needs initiated as soon as possible.)

#### Fiscal Year 1972

In Fiscal Year 1972 joint Federal-State program planning should be supported through customary channels without additional support from the Regional Commission. By this time, a coordinated budget for Federal agency participation in planning action programs can be processed through the Water Resources Council. In addition, the Legislatures of all member States will meet in 1971, and additional State funds needed to match Federal planning assistance funds and to support project director and other NERBC costs can be requested.

Major objectives for Fiscal Year 1972 should include:

- (1) Public hearings and other means of eliciting the views of interested parties are held in each State on rough draft plans.
- (2) State plans are revised on the basis of public reaction. Proposed final plans by State, and a regional plan showing major features of State plans, are published.
- (3) Detailed State-Federal program planning for coordinated action is initiated with full funding through the Water Resources Council (for Federal agency participation) and through State appropriations to State agencies (with assistance from Federal planning assistance programs).
- (4) Detailed planning on immediate action needs is pursued, and necessary authorities and funding requested.

#### Fiscal Year 1973

- (1) Program plans for State and Federal action to the year 1985 are completed.
- (2) Full implementation of State, Federal, Local and Private programs is sought.

This would complete the formal effort to develop a coordinated plan for use and development of the coastal zone.

It is impossible to estimate costs of program planning for FY 1972 and beyond. Coordinated budgets for Federal Agency participation ("Type 2" study) in coordinated Federal-State program planning studies may be requested through the Water Resources Council. Alternatively, it may be possible to go directly to individual program plans without the special apparatus of the coordinated budget. Subsequent planning and coordination would be sought through continued updating of State plans and regional plans, coordinated through NERBC.

#### Relationships to Other Studies

- (1) Existing State plans--for outdoor recreation, water resources, transportation, public investment--provide substantial information which can be disaggregated for the coastal zone. Similarly, local, metropolitan and special district planning programs recommend use and development of coastal resources.
- (2) The North Atlantic Regional Water Resources Study, due for completion in January of 1971, will provide information relative to long term demands and management alternatives for the entire region, for individual States, and for subregions, including coastal areas--but will not consider or recommend development for specific areas.

- (3) Two national estuarine surveys led by the Department of the Interior (under authority of P. L. 89-753 and P. L. 90-454) will provide information on existing uses of major estuaries; water quality conditions and effects of water pollution; future development needs and potentials; and estuaries warranting special Federal, State, or Local management and protection. These studies will be completed and reports filed in FY 1970.
- (4) The Corps of Engineers will complete in FY 1972 a study of coastal shore erosion problems of the region. This will be an important input.
- (5) The Corps is also conducting an initial fact-finding study of port modernization in cooperation with other Federal agencies, Port Authorities, and State and Local interests.
- (6) A special word is necessary relative to the Southeastern New England Comprehensive Study. This Federal-State, NERBC-led study is designed to develop a coordinated action program for use and development of water and related land resources of the entire Massachusetts and Rhode Island coastal area and tributary rivers.

The program suggested in this paper for Fiscal Years 1970 and 1971 is intended to apply to the SENE area as well as the rest of the region. NERC funding for State-led studies of the entire coastal region would help Massachusetts and Rhode Island develop clear goals and objectives beginning in FY 1970 for guidance of SENE. Detailed State and Federal program planning for the SENE area will be budgeted under the SENE study.

It has not yet been decided (as of September, 1969), and need not be decided for approximately one year, whether full scale comprehensive, coordinated joint studies comparable to SENE will be necessary for program planning in other coastal regions.

### Summary

This paper suggests that the five coastal New England States, the State of New York, and the Federal government join in preparing a coordinated plan and action program for use and development of the water and related land resources of the coastal zone of the NERBC region. It suggests that the New England River Basins Commission and the New England Regional Commission provide regional leadership, staff and financial support for the program; that each State lead in formulation of goals, objectives and plans for its coastal zone; that the States, the Federal government and the two regional agencies join in implementation.

The suggested study would include these major elements to begin in FY 1970 and end in FY 1973:

- (1) Develop plans for wise use and development of the coastal zone of each State. Federal and regional agencies would participate to provide for consideration of the regional and national interest. Plans would be initiated in FY 1970 and completed early in FY 1972, with interim reports to help guide current choices.
- (2) Plan coordinated action programs--State, Federal, Local--to implement State and Regional plans. Programs would be initiated as soon as possible on immediate action needs, accelerated in FY 1972, and completed in FY 1973 to provide a coordinated region-wide action program for the following 10-15 years.

This paper suggests that NERBC provide staff for coordination of the program, and that supplemental funding for State and Federal participation in FY 1970 and 1971 be provided by the New England Regional Commission. This paper assumes that the States, NERBC and Federal Agencies can participate to limited degree in FY 1970 and 1971 within existing personnel and budget limitations. In the case of States, major costs are anticipated to be supported by existing Federal planning assistance programs oriented toward coastal zone programs. Funding for FY 1972 and FY 1973 would be through customary State and Federal channels for water and related land planning.

The suggested approach is so designed that elements for FY 1970 and 1971 are complete units, that will constitute useful steps toward sound management.

The suggested approach:

- (1) Recognizes the responsibility and prerogative of the State to set goals and objectives for utilization of its resources, and suggests State leadership for formulation of land and water use plans;
- (2) Recognizes the regional and national interest in the coastal zone of each State, and provides for regional and Federal participation to secure consideration of these interests in development of land and water use plans by State;
- (3) Recognizes the necessity of coordinating State and Federal agency planning of action programs with State land and water use plans if such plans are to be meaningful; and
- (4) Makes use of existing Federal-State institutions for regional leadership and coordination.

APPENDIX

Statement by R. Frank Gregg, Chairman  
New England River Basins Commission

to

The Subcommittee on Oceanography, Committee on Commerce  
United States Senate  
Washington, D.C.

April 16, 1970

Mr. Chairman, Members of the Subcommittee, I am Frank Gregg, Chairman of the New England River Basins Commission. The Commission is a Federal-State agency for water and related land planning and coordination established under authority of the Water Resources Planning Act of 1965, and serves the six New England States and portions of New York. I appreciate the opportunity to testify on S. 2802, S. 3183 and S. 3460.

This statement will reflect the perspective of my two and one-half years as Chairman of the Commission, a period in which we have assumed that the Commission has statutory responsibility to prepare and coordinate plans for use and development of water and related land resources of the coastal zone of our region. Unless so identified, views expressed in this statement have not been formally endorsed by the Commission.

My remarks will raise and attempt to respond to a number of questions before the Subcommittee as it considers these bills.

In response to the questions I will:

(1) support the general thrust of the bills and specifically S.3183;

- (2) suggest that special care be taken to assure coordination of coastal zone activities at Federal and State levels with other agencies and programs dealing with natural resource planning and management;
- (3) suggest greater emphasis in State plans and programs on direct management activities of operating agencies, in addition to use of regulatory controls; and
- (4) suggest ways to assure that State and Federal programs affecting the coastal zone are harmonized.

Finally, the statement will report on how the New England River Basins Commission is attempting to organize effective coastal zone planning in its region, and will note the need for some clarifications of provisions of the bills relating specifically to river basin commissions.

- (1) Is a strengthened national effort to improve management of coastal land, water and related resources justified?

The answer here is clear, as indicated by the findings of the Commission on Marine Sciences, Engineering and Resources, the two Congressionally-authorized studies of estuaries, the Administration's submission of S. 3183 and other proposals for implementing the marine and estuarine studies, and the widespread interest of Members and Committees of the Congress in mounting a new national program to secure improved management of the coastal zone.

- (2) Is it necessary and desirable to establish distinct Federal and State machinery for planning and management of the coastal zone?

This is more complex.

It is natural that a study commission established to inquire into a special set of problems--such as those involved in the management of marine resources--tends to find a need for a restructuring of government institutions for dealing with those problems.



The Marine Commission made such a finding, recommending the establishment of a National Oceanographic and Atmospheric Administration which would, in addition to other responsibilities, administer a program of Federal grants to States for coastal zone planning and management. The Commission also recommended that the States be required to designate coastal zone authorities to receive Federal funds, and to administer the State coastal zone planning and management programs. S. 3183 is responsive to the substance of the Commission's recommended coastal zone program.

The Administration has concluded that administrative responsibility should be vested in the Secretary of the Interior.

The Department of the Interior now exercises a broad range of responsibilities in the coastal zone. Examples include primary Federal responsibility for marine fisheries and for fish and wildlife generally; for water quality; for outdoor recreation planning, coordination and financial assistance to the States; for administration of scenic scientific and historic areas of national significance; for mineral leasing on submerged lands under Federal jurisdiction; for research in such directly related areas as desalination and water resources.

There is no practical possibility that all Federal programs affecting coastal lands and waters can be consolidated in a single agency. Placing the Federal leadership role in the Secretary of the Interior, however, provides the most efficient means of coordination with the other major programs administered by the Secretary. Under the concept of "lead agency" responsibility, the Secretary is also directed in S. 3183 to secure coordination with other Federal agencies in review of State coastal plans, and in promoting consistency in Federal and Federally-assigned activities. Sec. 19(9) provides clear guidelines for these purposes.

There is no question that strong Federal leadership of a national program for improved management of the coastal zone can be secured by fixing prime responsibility in a single member of the Cabinet, the Secretary of the Interior, in accordance with accepted practice in administration of the Federal government. S. 3183 reflects the Administration position that the program should be administered by an operating agency rather than by the National Council on Marine Resources and Engineering Development, as proposed by S. 2802 and S. 3460. There are special problems in the vigorous exercise of administrative responsibility by an interagency body, including the difficulty of securing the personal involvement of political leaders of member departments and agencies.

I believe the Water Resources Council, as well as other councils, departments and agencies, can assist the Secretary in coordination that will be required under S. 3183. The Council is composed of the heads of many Federal department and agency heads with major responsibilities in the coastal zone. The Secretary of the Interior is its Chairman (by appointment of the President). The Council has professional staff. Its primary mission is national leadership in planning for optimum use and development of water and related land resources. It has specific responsibilities for periodic assessments of national needs for water and related land resources, coordination of Federal planning programs for the use of these resources, review of Federal-State water and related land planning programs (including those of river basin commissions) and administration of matching grants to the States for water and related land planning.

Within the States, the prospect of a major new Federal grant program for coastal zone planning and management may pose problems as well as opportunities.

Except for agencies whose responsibilities relate exclusively to marine resources, most State agencies involved in planning and management of the coastal zone operate throughout the State. Plans for use and development of lands and waters of the coastal zone are developed by State fish and game, parks, forest, water pollution, water resources, economic development, transportation and other agencies as elements of Statewide, and sometimes interstate and regional, plans.

I hope that the legislative history of a coastal zone program eventually approved by the Subcommittee will make it unmistakably clear that the Federal government is not pressing the States to establish agencies, plans and management programs for the coastal zone which are not fully integrated into the existing structure of natural resource institutions and programs at the State level.

The pending legislation assumes that a special effort to prepare and implement integrated plans for coastal zone management is necessary. This will, in most States, involve a number of planning and management agencies at the State level working together to develop an implementable and coordinated plan for the coastal zone that is also consistent with and contributes to Statewide plans.

In New England as elsewhere, the States are generally moving toward further consolidation of responsibilities for planning and management of land, water and related land resources. Massachusetts, for example, under Governor Sargent has approved legislation to establish a Department of Environmental Affairs under the leadership of a State cabinet official. Special study groups have filed reports recommending similar reorganizations with Governor Peterson of New Hampshire and Governor Curtis of Maine. Governor Davis of Vermont and Governor Rockefeller of New York have formally proposed the establishment of integrated departments of environmental and natural resources.

It is important that our response to coastal land and water management needs not invite fragmentation of these consolidation efforts.

S. 3182 is most constructive in this regard, providing only that the coastal state be organized to implement the coastal zone management plan. It avoids the implications attendant to the phrase "coastal zone authority" used in S. 2802 and S. 3460.

- (3) Do the pending bills encourage full use of tools available to State government for controlling use and management of the coastal zone?

I ask this question to point out what I conceive to be a deficiency in language, if not intent, of S. 2802, S. 3460 and S. 3183.

Criteria for the State coastal zone plans in all three bills could be improved in my opinion by more emphasis on planning of positive action programs by State agencies.

The bills place great emphasis on the development of land and water use plans, and on the implementation of these plans through direct exercise of State regulatory authority (or, in S. 3183, State Authority to require local zoning to conform to the State plan). S. 2802 and S. 3460 (in Sec. 304(a) and 305(a), respectively) also require the State coastal zone authority to have authority to reject State, local or private development plans not consistent with the State plan. (This authority is implicit, but might be usefully made explicit in Sec. 19 (d) (3) (C) S. 3183.)

These are necessary and useful provisions. It seems to me, however, that the pending bills might be importantly strengthened by language which would require the responsible State agency to secure and demonstrate positive participation by appropriate State agencies in preparing the State coastal zone plan.

S. 3183 (Sec. 19(d)(3)(D)(ee) and (ii)) comes close to this requirement; a showing of positive participation by State agencies could be required in (ii).

Unless the coastal planning process incorporates the project planning activities of State line agencies, the responsible State agency may be in a continuously defensive posture in attempting to review specific project proposals. The best way to secure State agency cooperation in coastal zone management is to get them involved in the planning process.

The same point is made later in this statement with respect to Federal agencies.

(4) How can State and Federal plans and programs in the coastal zone be most effectively harmonized?

The bills before the Subcommittee recognize national and regional interests in the management of individual State coastal zones. The bills do not, however, outline specific procedures for assuring that these interests are fully identified and considered in formulation in the field of State coastal zone plans.

The extent of national interest and Federal agency involvement in coastal zone activities make it extremely important that Federal agencies assist and participate at field level in the development of State coastal zone plans.

The pending bills do not prohibit such involvement; they actually encourage it to a degree.

The States are enjoined in S. 2802 and S. 3460 (Sec.304(b)) to consult with regional and Federal agencies.

S. 3183 (Sec.19(d)(3)(D)(ee) and (ii) is much stronger and clearer on this point. The Secretary, prior to granting approval to a State management program, must find that the State plan (1) describes means for coordination of the coastal zone plan with other resource use plans, including Federal, interstate and regional plans; and (2) was developed in cooperation with relevant Federal, State and local agencies.

I am not convinced that reliance solely on after-the-fact Federal review of State plans will adequately serve the objective of harmonizing Federal and State viewpoints. Once the State plans are formulated reconciliation may become as much a contest between levels of government as a search for the common interest.

I want to emphasize also that this suggestion does not imply any lack of confidence in the States. On the contrary, I am concerned that Federal agencies may not accept State coastal plans as controlling unless they--and the interests and programs they represent--have been involved in the development of the State plans. Field-level participation may be a way of securing the cooperation of Federal agencies in implementation of State plans.

The States must, of course, be solely responsible for making their own decisions on the content of the plans and management programs submitted to the Secretary of the Interior for review.

At the Federal level, arrangements will have to be made by the Secretary for getting the views of other Federal agencies (in Washington and from the field) having responsibilities and activities affected by the State plans. With these inputs there will be a firm basis for resolving any differences between the States and Federal agencies. States should be able to expect Federal adherence to State plans prepared and evaluated in this fashion. And Federal agencies should be able to expect State support for specific project proposals which will help implement the plans.

It should also be noted that Federal agencies have technical competence and data which, if appropriately utilized, can substantially strengthen the depth and precision of State-led planning efforts. Even with generous Federal financial assistance, the scarcity of professional talent will for some years make it difficult for each of the coastal States to maintain and sustain adequate staff for coastal planning programs.

State-Federal cooperation in planning will bring together those officials in the States and in Federal agencies who will be called upon to design and carry out specific management programs.

The shared experience of joint plan development of State and Federal officials in the field is a substantial argument for joint planning.

#### The New England River Basins Commission Approach

The New England River Basins Commission has developed an approach to coastal zone planning in its region in the context of its responsibility to prepare and keep up to date comprehensive plans for use and development of the water and related land resources.

A framework-level study identifying long range demands, deficiencies and problem areas, and suggested general alternative solutions, is now nearing completion. This study--the North Atlantic Regional Water Resources Study (NAR)--is being carried out by a joint Federal-State coordinating committee under the leadership of the North Atlantic Division, Corps of Engineers.

The Commission will publish for use within the region a separate document drawn from the NAR study, setting forth a framework for meeting future water and related land requirements. Coastal resource problems and needs will be included.



In selecting priorities for planning to outline specific programs for management of major subareas of New England, the Commission has given first priority to a joint Federal-State study of Southeastern New England (SENE). The SENE study area includes the rivers, lakes, coastal reaches, bays and estuaries of eastern Massachusetts and virtually the entire State of Rhode Island. This area includes Cape Cod, Narragansett Bay, Buzzard's Bay, Boston Harbor, the Ipswich marshes and other coastal and estuarine complexes of great importance, as well as the rivers and lakes and their watersheds and shorelines.

The study will recommend a 10-15 year action program for management of water and related land resources in the area, including resources of the coastal zone. The program will be directed by a joint State-Federal coordinating body, and will concentrate on planning of coordinated programs and projects of State and Federal agencies. State boundaries will be used as basic planning regions, as well as hydrologic and other physiographic regions as required. The states of Massachusetts and Rhode Island have tentatively agreed to provide professional staff to assist in direction of the study, supplementing staff inputs from the Commission and from Federal agencies. It is our intent to develop a joint action program, with reports designed to provide a basis for authorization of action programs and appropriation of funds by the States as well as the Federal government.

In the SENE study, we hope to provide for development of goals and objectives for management under State leadership, with participation by Federal agencies and NERBC staff to supply data and technical capacity, and consideration of regional and national needs. With agreement on goals and objectives, detailed planning of State and Federal action programs can go forward with reasonable assurance of coordination of management activities.

In addition to the Southeastern New England Study, the Commission has considered ways to organize joint State-Federal planning in other coastal regions--the Maine-New Hampshire coast, and the Connecticut-Long Island coastal areas. In fact, the Commission has approved a general approach to coastal zone planning which assumes State leadership in formulation of goals and objectives, Federal financial assistance for State planning and Federal participation coordinated by the Commission.

The Commission will provide regional coordination for such an approach. Our intent, of course, is to assist the States, and Federal agencies, in developing plans which:

- (1) reflect the needs and aspirations of each State;
- (2) reflect regional considerations and the national interest;
- (3) are fully accepted as the basis for subsequent action programs by all participants, and are used as a basis for the conduct of line agency programs as well as a general guide to land and water uses.

Relationship of Pending Proposals to New England River Basins  
Commission Program

It is important to emphasize that there is little conflict between bills the Subcommittee is considering and our Commission's general approach.

A new national program to strengthen coastal zone management, and particularly new grant funds for State coastal zone programs, will help the States provide the kind of leadership for Federal-State and regional cooperation we are developing in our region.

The pending legislation, as I read it, does not preclude the participation of Federal agencies in State-led planning, nor does it preclude the use of the Commission as a regional leader and coordinator. Fortunately, the Commission needs no additional legislative authority to serve as a vehicle for State-Federal coordination. A core Commission staff now exists (under the 50-50 State-Federal cost-sharing formula established under the Water Resources Planning Act), although additional staff support would be necessary if the Commission staff is to participate in planning by all member States simultaneously. And Federal agencies--through coordinated budgets developed by the Commission and submitted through the Water Resources Council--may (under existing law, subject to action by the Administration and the Congress) request appropriations for participation in joint development of State plans in areas served by river basin commissions.

A missing ingredient, which might be adequately taken care of by legislative history, is a positive statement on the desirability of field-level, Federal assistance and participation in the development of State coastal zone plans.

In short, New England now has--through the Water Resources Planning Act, and the New England River Basins Commission--useful machinery for cooperative and coordinated State-Federal and regional planning for the coastal zone. In terms of implementation, joint planning carried out through NERBC is directed particularly at public investment in resource management, and especially at State and Federal agency projects.

Enactment of legislation along the lines of S. 3183 would very substantially strengthen the State's leadership role in planning. State-led planning related to zoning and other regulatory activities would be particularly strengthened.

Grants to States for implementation of coastal zone plans, again with particular regard to State regulatory controls, would add real strength to management, beyond the existing program and project authorities of State and Federal natural resource management agencies, which are the focus of Commission planning efforts.

I emphasize that the New England River Basins Commission is a planning and coordinating agency. It does not have, under the Water Resources Planning Act, regulatory or management authority, and it does not seek or want these authorities.

The Commission consists, however, of institutions--the States, and Federal agencies--which do have authority for planning, regulation and management. It is a workable vehicle for helping achieve effective management through joint planning and close coordination.

Grants under the pending bills would help make the planning partnership more meaningful in the coastal zone.

#### A National Pattern of State-Federal Cooperation

Obviously, not all coastal areas are served by existing intergovernmental institutions which can serve, as this Commission can, to promote and coordinate regional cooperative planning.

The Great Lakes Basins Commission, however, seems to have and to be exercising a clear mandate for leadership of joint State-Federal water and related land planning in its region. As is the case in New England, there is nothing inconsistent about the concept of joint planning as practiced by the Great Lakes Commission, and provisions of the pending bills to provide Federal funds to help formulate management plans for the Great Lakes drainage area by State, and to help implement such plans.

The Pacific Northwest River Basins Commission is in a position to strengthen State-Federal coordination within its area. Existing interagency committees for water and related land planning (with State participation) could help secure joint planning in their regions; these should probably be analyzed on a case-by-case basis.

Where institutions suitable for cooperative planning are not available, the administrator of the coastal zone grant program could be encouraged to explore the use of interagency field teams for this purpose.

Reference to River Basin Commissions in the Pending Bills

S. 2802 and S. 3460 (Sec.303(h) and Sec.304(g), respectively) provide that "coastal States may jointly designate an interstate agency of which they are a member, including a river basin commission, to serve as a coastal authority, in which case such authority shall be subject to the same provisions as a State agency for the purpose of this title, and shall be entitled to funding equivalent to the sum of the allotments of its member States."

In S. 3183 (Sec.19(d)(5)), "the Governor of a coastal State may allocate to an interstate agency a portion of the grant under subsections (c)(for planning) and (d)(for implementation) of this section for the purpose of carrying out the provisions of said subsections provided such interstate agency has the authority to meet the applicable provisions of subsection (d)(3) of this section otherwise required of the coastal state.

Some comments on these provisions:

- (1) River basin commissions established pursuant to Title 2 of the Water Resources Planning Act of 1965 are interstate and inter-governmental (Federal-State) commissions. Presumably the language should be changed if the intent is to provide for designation of Title 2 commissions.
- (2) River basin commissions established under the Water Resources Planning Act cannot qualify in any event under the language. In order to meet "the same provisions as a State agency", the commissions would, as I read it, be required to have the authorities (condemnation power, zoning, etc.) spelled out in Sections 304(a) and 305(a) of S. 2802 and S. 3460, respectively, and Section 19(d)(3)(C) of S. 3183. The "Title 2" commissions can meet none of these requirements.
- (3) The effect of the language is to exclude river basin commissions from designation as coastal zone authorities.

Thus changes in the bills should be made if Title 2 commissions are to participate effectively in the coastal zone program. I believe strongly that the commissions have a key role to play in their regions and urge that perfecting amendments be developed to encourage their effective involvement.

Mr. Chairman, I believe strongly that the public interest will be served by Congressional enactment of legislation establishing strengthened national program to secure sound management of the coastal zone. You can be assured of strong support from New England.

Thank you for the opportunity to express these views.

## ALTERNATIVES IN THE PUBLIC CONTROL OF PRIVATE LAND USE

Mary Louise Hancock  
New Hampshire State Planning Director  
Concord, New Hampshire

I wish I could tell you that the State of New Hampshire, or any other state, is even somewhat organized in efforts to soften the impact on our coastal resources. I wish I could tell you that, indeed, the State of New Hampshire has agreed upon a land use plan to guide such efforts, and that the coastal communities and regions support the plan.

To date there have been uncoordinated endeavors by public, quasi-public, and private agencies to do all sorts of things: save the marshes, develop the marshes; create a state park, build an industrial park; zone for open space, zone for residences.

Meanwhile, both year-round and seasonal population growth has spiraled, creating an even greater potential for confusion and dissension. In my opinion, this will continue until the State governments, aided by Federal funds, and working closely with the communities and regions, conduct coastal zone studies such as those outlined in proposed legislation now before Congress, and develop a land use plan that has the support of both State and Local public bodies. More importantly, we must agree that we will implement our plans with controls.

A Citizen's Task Force has recently concluded a review of governmental functions, purposes, and requirements in New Hampshire. I should like to quote from the Committee on Environmental Systems:

"It would be nice if all of the conflicts would resolve themselves. Nice if governments--State and Local--could stay out of it all. Nice if each of us could use his land as he wants. But can we?



"Who are we? We are individuals who want only to build a home in a quiet place and be undisturbed. We are, also and unfortunately, great chain stores that want to enclose 3 acres of space in a square box and lay 10 acres of hot-top. We are men who want to park a mobile home on 40 feet of lake-side. We are owners of junk yards and gas stations and billboards and gravel pits and snowmobiles and high-horsepower outboards and houseboats and automobiles; and all of us together are doing a pretty good job of raising havoc with the New Hampshire environment."

So we must come to certain conclusions about how we are going to deal with community development, and again I should like to quote from the Committee:

"1. The State can, itself, adopt, administer and enforce plans for regions of the State, zoning, subdividing, building inspection and other health and safety features. It can recognize that in over a quarter of a century in which its municipalities have had such powers about half of them have failed--or been unable--to act. The State could hire the staff to make the studies and do the other things towns have been unable to do.

"Such a course would run counter to a strong sense of local determination that exists in New Hampshire. Control of land use would be remote and centralized in such a system; or

"2. The State can enable towns and cities to meet their needs through cooperative regional groupings--worked out among the towns themselves at the local level. Regional control of land use makes more sense, anyway, than widely diverse controls by immediately contiguous towns. The State can encourage and help towns to cooperate and provide dollars to meet the cost of such expanded public service; or

"3. The State can do nothing. In that event, the loss of prospect and beauty and the good life will be slow but inexorable."

I think it is clear that the States must assume the leadership and authority in land and water planning, and that this realization is reaching the executive and legislative offices of our State.

I know that the many groups who have "talked" marsh acquisition for many, many years will soon act to make that acquisition real; I know that the special session of our legislature will pass a dredge and fill bill they could not have gotten through even a year ago; and I know the communities will accept and, indeed, demand land and water controls if time is taken to show that the public good is better served with a duck sanctuary than a marina. Best of all I know there are forces at work that will make this happen in New Hampshire.

One of our many jobs now is to see that the same course of action happens throughout New England. Each state must, through the New England River Basins Commission, put together a workable and attainable program--if we really want one.

## CITIES IN THE COASTAL ZONE: CONFLICTS AND OPPORTUNITIES

Eileen Foley, Mayor  
Portsmouth, New Hampshire

Being a mayor these days is something like being the president of a college: a job full of blood, sweat, and tears; and bigger than any one man or woman. I am reminded of the occasion on which the president of Brown University in Providence announced that he was going to resign. He said that, among other things, he was resigning because he really wasn't happy in his job. The very next speaker on the program commented that he didn't think that college presidents were supposed to be happy in their jobs. I suppose the same observation applies to mayors...yet people continue to want to be college presidents, and other people continue to run for mayor.

My problems as Mayor of Portsmouth are more similar to the problems of mayors in other cities than you might suppose. The principal reason for this is that city government has been the forgotten man of the twentieth century. From us, much is demanded; to us, little is given.

Mayor Lindsay, Mayor Stokes, Mayor Yorty, Mayor Daley...and Mayor Foley. Although the size of our cities and our political philosophies may be diverse, there is much that we can all agree on.

Although a few cities have resorted to exotic kinds of taxation like the payroll tax or a city income tax, the principal source of city revenue continues to be the property tax. Since there is a limit to how much weight you can place on any single beast of burden the property tax probably has an upper limit that we cannot surpass: the so-called confiscatory rate. Nevertheless, the demands on the city have no upper limit, and spiral upward like the trail from a Saturn booster rocket.

In New Hampshire, Portsmouth is unique among cities in more than one respect. We are concerned about that unique quality which stems from its seacoast location. Is that kind of location currently a plus or a minus factor? It is difficult to say. I think that if we were able to capitalize fully on such a location, there would be no doubt that it is a benefit. At the present time, however, when so many of the obvious benefits of coastal siting are denied to us, I think we must count our situation as an additional demand on the city coffers.

For instance: where the seacoast might offer us an immense recreational resource, the waters presently off Portsmouth are too polluted to make for pleasant swimming. In addition, most of the land abutting the water has long been commercially developed. We may not consider such development the most beneficial of shoreline land uses. In the early days of seacoast development, however, with inland transportation a far greater problem than coastal transportation, the founding fathers tended to squeeze everything as close to the docks as possible.

Portsmouth was a busy port in those days, so that a seacoast location provided an economic impetus to the city not shared by all its inland sisters. Today, however, the economic value of coastal sites (in terms of shipping) can be questioned. In Portsmouth we have the State docking facilities within our city limits. However, it may be emphasized that these facilities are not tax-paying properties, since they are owned by the State. While some amount of income now accrues to New Hampshire from the facility through its rental to a concessionaire, the City of Portsmouth gets a questionable return. Cargoes are landed and trucked out of the city, or trucked in and shipped out, providing only a very small need for local employment and no direct city income. Other port facilities up-river do not provide any income to Portsmouth at all.

Shipping, conversely, carries with it a twentieth-century problem: pollutants. We in Portsmouth cannot believe that the situation will improve in the years ahead. Maine has passed stringent legislation, but New Hampshire's laws are far weaker. For instance, the 1969 statute that relates to coastal pollution does not mention penalties for the polluter. New Hampshire has passed a new law just this month that provides for a committee to study the petroleum pollution problem, but I am willing to wager that no study will recommend paying Portsmouth for damage done by oil slicks at her door. If the study suggests new and stricter laws, I believe they will pass. That is the temper of the times. If a polluter must pay a fine, the State will receive such recompense. It will, however, be Portsmouth docks and coastline that are lapped by the oil-slicked waves. Who will pay for damage to the individual commercial enterprise and for damage to public lands in Portsmouth?

These kinds of conflicts are not really new, but I believe they are increasing in number and complexity. Progressive conservationists and forward-thinking legislators are among the most significant perpetrators of this kind of anti-city inequity.

I would like to remind you that I am also a legislator. Because I serve Portsmouth as Mayor, I believe I am one of very few New Hampshire legislators who take the time to examine the city-related ramifications of the laws we vote on and pass or defeat. I try not to support any measures that will impose unsupportable burdens on cities without providing the funding that will lighten the load. New Hampshire, however, like most states, continues to tell its cities what to do without providing them with the wherewithal to do it.

A case in point is the demand for sanitary landfill operations at all dumps in New Hampshire, with cessation of burning. As a member of the New Hampshire Committee on Natural Beauty, I can wholeheartedly concur. As a member of the State Legislature, I see the necessity clearly. But as the Mayor of Portsmouth I can recognize the problems faced by many of our large and small municipalities trying to respond to that order. Sanitary land fill costs more than a burning dump. A full incinerator operation, or open pit burning, costs more than sanitary land fill. Where's the money to come from?

This is not the only kind of circumstance where the city finds itself on the other side of the fence from its friends, the conservationists and the lawmakers. Let us consider the problem of locating a commercial plant in our city, perhaps even along the river that one might suppose to be one of our assets. Our immediate view in Portsmouth is that such a potential siting is probably advantageous because the taxes to be engendered will permit us to undertake some of the projects we may have been dreaming about for years. At the same time, the friendly conservationists may announce in no uncertain terms that the proposed location is not practical for environmental reasons. Perhaps they're right, but in the meantime, my city needs revenue. Perhaps there may be a law already enacted that will make the proposed location subject to review by a number of committees: a time- and money-consuming process. While I will agree that this kind of review is necessary, I cannot help but believe that my city should be indemnified for the time and labor the legally-established committees make necessary, and for the possible loss of city revenue occasioned by the impact of conservation law on plant siting.

In Portsmouth we are large enough to be able to employ some of the experts required in order to join in such legal investigations. In smaller towns, this kind of expertise is beyond the municipal budget. Who pays then? Where does the community acquire the technical knowledge necessary to cope with the technology of today? The answer is that no one pays and the towns simply never get the help they need...or almost never.

What I am suggesting is not a wholesale abandonment of conservation law. What I recommend is the full consideration of the plight of the city when affected by such law; possible remunerative sections in the law; or perhaps a provision for technical aid to the community. In short, a recognition of the city as a full partner in government.

It has been said that the seventies will be the decade of the cities... a period of time in which the federal government and the states must give a long-lost due to the suffering city. Most of the problems that are supposed to engender this new concern are related to education, welfare, poverty, and the minorities. I am suggesting a new consideration: the environment. As this decade is also to be devoted to conservation and preservation, the cities will continue to feel a larger and larger impact from restrictive legislation. Let us not forget this impact as we view Coastal City, New Hampshire, USA, in the years immediately ahead.

## COASTAL PLANNING IN MAINE

Philip M. Savage, Director  
Maine State Planning Office  
Executive Department  
Augusta, Maine

From advance information on this New England Regional Coastal Zone Management Conference, I understand that the main purpose of this meeting is to assess current planning activities with particular emphasis placed on practical experience and development efforts, and to look at the current situation as it pertains to the New England States. Therefore, I would like to present a brief report on our experience with coastal planning in Maine.

Since early November 1969, the State of Maine has been engaged in a formal, organized, coastal planning effort. This planning task is a top-priority project for the State Planning Office as part of its statewide planning responsibility. There is an obvious and urgent need for such a plan to assure sound and orderly development as a means to conserve one of Maine's greatest assets, its coastal resources. Moreover, public concern and interest over the protection of these coastal resources has increased rapidly during the past year. At present, it would be very difficult to conceive of a more timely or important planning project in such a vital development area for the State of Maine.

As a demonstration planning project, its findings and recommendations will serve the New England Region and the entire nation as well as Maine. Coastal areas promise to be the scene of great and immediate development activity throughout the nation. These areas will be subject to increasing demands because of the present and future concentration of population and economic activity.



Maine is now experiencing unprecedented demands for use of its coastal resources. Commercial developers, land speculators, industrial concerns, conservationists and recreationists along with many other interests are in competition for the use of Maine's coastal areas. The need for a Coastal Development Plan to guide the use of our coastal resources is, therefore, immediate and well-established.

The ultimate task and purpose of the project will be the preparation of a comprehensive development plan for the coastal area of Maine. Although there is some variation in the context of comprehensive plans, this plan will place initial emphasis on a land classification system with development standards to be applied to specific areas. This classification system will be designed to permit adoption and enforcement of land-use controls by appropriate Local, State, and Federal levels of government to guide sound development practices by both private enterprise and public agencies. Necessary state legislation and local ordinances will be recommended, along with financing proposals and administrative arrangements.

Special attention will be given to water use along with the traditional concern of planners with land use. An attempt should be made to relate proper land use to increasing water use and deal with the problems involved in the regulation of offshore activities. Among other subjects, this task would include defining regulations needed to control mineral exploitation such as gas and oil deposits; establish an adequate information base and scientific approach for conservation laws; deal with problems arising from marine recreation; consider navigational limitations and port development; and consider in detail the overall pollution problem in relation to recreational, commercial and industrial development.

The Maine Coastal Plan can also serve as a pilot program for development of a cooperative State-Federal Coastal Zone Plan and Action Program. The State will prepare a plan for coastal development and management considering State, Regional, and National needs and objectives as the first phase of the effort. Following preparation of the State development plan, the second phase of the program will be initiated with Federal and State agencies preparing action plans for carrying out public sector responsibilities.

The New England River Basins Commission will provide coordinated regional and national inputs to the study developed with Federal and State agencies, and will work with the State of Maine in shaping the plan.

We are now nearing the completion of Phase I of this study. Since November we have organized a Coastal Planning Advisory Task Force which includes 16 members from relevant state agencies and educational institutions that have a contribution to make. With the assistance of this group, we have established the following major goal and supporting objectives for the Maine Coastal Plan:

Goal: To develop a comprehensive plan providing for compatible and multiple uses of the coastal zone, optimizing those intrinsic and real values assuring the greatest long-term social and economic benefits for the people of the State of Maine.

- Objectives:
1. Inventory coastal resources and existing uses.
  2. Develop a resource classification system with appropriate uses and development standards as a basis for zoning coastal uses.
  3. Identify areas of major and impending conflicts and indicate priorities for immediate action.
  4. Propose regulations and controls to insure that coastal resources will be used consistent with their natural character and ecological relationships.

5. Elicit public views and interests through public hearings and other concurrent planning.
6. Coordinate efforts with other New England Coastal States, Regional groups and Federal agencies.
7. Propose institutional arrangements, State legislation, and local ordinances necessary to implement the Maine Coastal Plan.

The Task Force has also made an initial definition of the Coastal Zone for the Maine Coastal Plan to consist of all coastal minor civil divisions on tidewater and associated marine areas within which conflicts may occur. This zone includes 131 minor civil divisions, 3,100 square miles, and over 600,000 people. This is, in general, a ten-mile deep strip along the coast and tidewater areas. In addition, we have selected a pilot area to test inventory and classification procedures, and are preparing an annotated bibliography of related material.

We expect to start soon on the organizational, institutional, and economic aspects of this study. The institutional aspects will deal with the proper type of organizational structure to deal with this management problem; the economic aspects will concentrate on aquaculture, energy-power needs (with emphasis on the siting and location of power plants), the tourist-recreation aspects, and petroleum-related industries.

We hope, perhaps optimistically and with considerable Federal Aid, to complete this plan by the end of 1972.

On March 27, 1970 Governor Curtis issued an Executive Order on Cooperative Action to Protect Maine's Coastal Zone. This directs all state agencies and departments to refer future plans and proposals for construction and developments in the Coastal Zone to the State Planning Office for review in light of the developing coastal plan. This Order also requests Federal, Regional and Local agencies to do the same.

Since November the State of Maine has, I believe, established a firm foundation for future planning activities by setting goals and objectives; defining the Coastal Zone; establishing an Advisory Task Force; determining the capabilities and contributions of state agencies; and conducting an inventory and analysis of existing studies related to this plan. Up to now this has been a "do-it-yourself" plan with only a modest grant of \$25,000 from the New England Regional Commission for this purpose. We will need much more financial support for this plan to meet our work schedule.

Above all, we need help soon to develop a land classification system designed to permit adoption and enforcement of land use controls. It is apparent that what this coastal planning program will encompass cannot be forecast or completely anticipated at this time. It is also apparent that demands on the coastal region will continue to mount as the plan progresses. Given this situation, there are certain tasks that cannot wait. One such task is to find solutions to urgent problems created by expanding developments along our coast. The proper guidance and regulation of land use and certain economic activities must have our primary concern. If we do not get in a position to control developments soon, our future options will disappear. The immediate concerns for solution of these pressing problems must accelerate by the vigorous utilization and application of our present knowledge and existing capabilities. On the other hand, there are tasks that can wait for information resulting from research and experimentation in this planning program.

The ultimate success of this coastal plan, along with its successful implementation, clearly depends on the effective cooperation of the State, Federal, Regional and Local agencies. It follows, then, that effective inter-agency and inter-governmental cooperation depends on a positive plan of action and full utilization of the many disciplines available. We must take an organized and disciplined approach to this task so that we can avoid the mistake of too many people and a great many agencies rushing off in all directions. Effective legislation must provide for a central coordinating office at the State level to oversee and bring together in proper relationship all elements of coastal planning.

This need for integration of effort also applies to the Federal level. Coastal planning assistance at the Federal level should be developed within a consistent policy and administrative framework to avoid the existing duplication, conflict in goals, and piecemeal approach that is all too typical of present Federal planning assistance programs. Coastal planning programs at the Federal level should provide for program consolidation, integrated funding and simplified administrative procedures under the control of a single Federal agency.

Finally, we must realize that the proper planning and management of our coastal lands will involve major decisions of public policy. This fact will require a reexamination of our public institutions and inter-governmental arrangements which will make proper decisions or fail to make them. Under our existing Federal form of government, it is the State which has jurisdiction over most of our coastal resources. Of all the governmental jurisdictions, it is the most appropriate level of government to decide how these lands and abutting water are to be developed.

Nevertheless, present State authority over the coastal lands frequently does not seem to have the institutional muscle necessary to deal with the problem. For example, there is no single focus for guiding rational development because conservation, economic promotion, pollution control, tourism, highways and community planning are considered separately. State funds for land acquisition in these areas are very hard to come by, and legal control over land use in our State is either non-existent, very complex or very ineffectual. Finally, ambiguous and overlapping jurisdictions between Local, State and Federal governments create serious problems. The large area of coastal land and the extensive marine environment requires a large-scale comprehensive approach for adequate solution to its problems.

It is necessary then to strengthen the state role and improve coordination among the participating elements so as to protect the public interest. Possible state zoning of land and permits for explicit projects plus comprehensive and continuing planning for the coastal areas all have a place, but none will be effective until our State is prepared to enforce difficult decisions.

## APPENDIX

### Maine Coastal Development Plan Work Program Maine State Planning Office November, 1969

#### I. Need

This proposal is presented as a top-priority project for the State Planning Office as part of its statewide planning responsibility. There is an obvious and urgent need for such a plan to assure sound and orderly development as a means to conserve one of Maine's greatest assets, its coastal resources. Moreover, public concern and interest over the protection of these coastal resources has increased rapidly during the past year. At present, it would be very difficult to conceive of a more timely or important planning project in such a vital development area for the State of Maine.

As a demonstration planning project, its findings and recommendations would serve the entire nation as well as Maine. Coastal areas on our seacoast promise to be the scene of great and immediate development activity throughout the nation. These areas will be subject to increasing demands because of the present and future concentration of population and economic activity on long stretches of our seacoast.

This state is now experiencing unprecedented demands for use of its coastal resources. Commercial developers, land speculators, industrial concerns, conservationists and recreationists along with many other interests are in competition for the use of Maine's coastal areas. The need, therefore, for a Coastal Development Plan to guide the use of our coastal resources is immediate and well-established.

## II. Purpose

The ultimate task and purpose of the project will be the preparation of a comprehensive development plan for the coastal area of Maine. Although there is some variation in the context of comprehensive plans, this plan will place special emphasis on a land classification system with development standards to be applied to specific areas. This classification system will be designed to permit adoption and enforcement of land-use controls by appropriate Local, State and Federal levels of government to guide sound development practices by both private enterprise and public agencies. Necessary State legislation and local ordinances will be recommended, along with financing proposals and administrative arrangements. Background information on transportation, population, community plans and individual state goals would be included in the plan documents.

Special attention will be given to water use along with the traditional concern of planners with land use. An attempt should be made to relate proper land use to increasing water use and deal with the problems involved in the regulation of offshore activities. Among other subjects, this task would include defining regulations needed to control mineral exploitation such as gas and oil deposits, establish an adequate information base and scientific approach for conservation laws, deal with the problems arising from marine recreation, consider navigational limitations and port development, and finally, consider in detail the overall pollution problem in relation to recreational, commercial and industrial development. The object of this aspect of the study will be to make compatible through planning and regulation many of the present incompatible uses of water and land along our coastal areas.



### III. Regional Development Strategy

The Maine coast will also serve as a pilot program for development of a cooperative State-Federal coastal zone plan and action program. The State will prepare a plan for coastal development and management considering State, Regional and National needs and objectives as the first phase of the effort. Following preparation of the State development plan, the second phase of the program will be initiated with Federal and State agencies preparing action plans for carrying out public sector responsibilities.

The New England River Basins Commission will provide coordinated regional and national inputs to the study developed with federal and state agencies, and will work with the State of Maine in shaping the plan. In addition, the Commission will hold a conference focusing on the New England coastal zone and its problems. The Commission will publish a report resulting from the conference and including a framework for additional action in the coastal zone. The report might be titled "Outlook for the New England Coast."

### IV. Tentative Time Schedule

#### A. Phase I (11/69 to 3/70)

This time period will be devoted to determining who should participate, the nature and scope of their contribution, how various capabilities and inputs may be integrated for optimal results, and the preparation of a detailed schedule of events. This time period would also be directed toward establishing study procedures and methodology. This would include the following tasks:

1. An inter-agency Coastal Planning Advisory Task Force of State agencies will be formed as a working unit to assist in the preparation of the plan.
2. Preliminary goals and objectives will be established so that those participating organizations may be better coordinated and related in their day-to-day activities.

3. An inventory and analysis of existing studies, public and private, related to the plan with special emphasis on State, Regional and Local planning groups, will be conducted.
4. Procedures and coordinating activities and techniques will be established. A critical path schedule will be prepared to illustrate the sequential relationships of major activities relating to preparation of the plan.
5. Determine the capabilities of each participating State, Federal, Regional, Local and Private agency in their contribution to the formulation of the plan.
6. Liaison and working relationships with Regional, State, Federal agencies, and private groups will be established.

B. Phase II (3/70 to 12/70)

The year will be devoted to gathering and compiling basic data and to develop procedures for establishing an initial inventory and classification system. An examination and evaluation of inter-agency and public-private coordination would be conducted with an objective of creating an effective planning partnership and coordinating machinery to establish regulation and controls for water and land use in the coastal zone. This will include the following activities:

1. Define the coastal zone to be studied.
2. Develop the procedures and content of a coastal resource and land-use inventory and classification system.
3. Prepare a basic inventory of the natural and land-use characteristics of the Maine Coast.
4. Compile data concerning the physical type use and ownership use of natural resources.
5. Determine coastal land and water use trends.
6. Classify coastal resources based upon their natural characteristics, ecological relationship and land-use features.
7. Publish an interim plan.

C. Phase III (1/71 to 12/71)

1. Conduct public hearings and utilize other means of eliciting the views of interested parties on the interim plan.
2. Revise the interim plan on the basis of public reaction and additional information.
3. Identify major land-use conflicts and indicate priorities for immediate action.
4. Evaluate the environmental impact of existing and anticipated demands for the use of coastal resources.
5. Propose action relative to priority needs and future trends.
6. Propose regulations and controls to insure that coastal resources will be used consistent with their natural character and ecological relationships.
7. A final comprehensive coastal development plan will be published late in 1971.

D. Phase IV (1/72 to 12/72)

1. Propose institution arrangements for implementation and enforcement action.
2. Propose State legislation and local ordinances necessary to implement the coastal development plan.
3. Conduct detailed planning on immediate action programs with the necessary authorities.
4. Prepare a detailed State-Federal-Regional Program for coordinated action throughout the New England Region.

THE RHODE ISLAND COASTAL ZONE:  
RESOURCE MANAGEMENT AND POLITICAL REALITIES

Daniel W. Varin, Chief  
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Rhode Island's coastal zone has been described as the state's greatest natural resource. This description is appropriate, because the state does not have natural resources in the traditional sense--coal, oil, or ores. As a resource, the coastal region, and Narragansett Bay in particular, has had a decisive impact on the initial settlement of Rhode Island; on the development of agriculture, trade, and manufacturing; and on its way of life.

In March 1969, Governor Frank Licht appointed a technical committee on the coastal zone as the first step toward drafting future management policies for Narragansett Bay. This step was taken in response to growing recognition that Rhode Island does not have adequate mechanisms for formulating or implementing policies designed to protect, develop, and restore the resources of the coastal zone.

The Committee was charged with determining the need for a resources management mechanism for the Rhode Island coastal zone and with recommending what type of mechanism, if any, should be established. Members of the Committee represented the State Departments of Natural Resources; Health; Public Works; Community Affairs; the Water Resources Board; the Governor's Office; the Budget Division; the Statewide Planning Program; and the University of Rhode Island. Staff assistance was provided to the Committee by the Graduate School of Oceanography of the University of Rhode Island, the Department of Natural Resources, and the Statewide Planning Program.

The Committee undertook several activities to meet its charge:

1. Initial contact with those interested in the coastal zone was made through a questionnaire sent to about 70 agencies, groups, and individuals involved in commercial, industrial, recreational, tourism, educational, research, regulatory, and enforcement activities. The questionnaire was designed to obtain information on the users of the coastal zone; the kinds of activities they conduct; the conflicts which they encounter with other activities; their plans for future activities or expansion of current operations; and their viewpoints on the problems and potentials of the area.
2. Using the basic information obtained through the questionnaires, the Committee held a series of meetings to develop further data on the activities going on in the coastal zone; their size and location; trends in growth or decline; future plans; and conflicts between activities. These meetings were attended by representatives of the U.S. Navy; state and federal regulatory and enforcement agencies; marine-oriented industries and industrial development and promotion agencies; city and town governing bodies; planning, conservation, and industrial development agencies; public works departments; harbor masters; commercial fishing; marine transportation interests; and recreation and conservation groups.
3. A subcommittee was established to study legal jurisdictions. The subcommittee included representatives of the Executive Counsel's office, the Law of the Sea Institute of the University of Rhode Island, and the New England River Basins Commission.
4. A series of working papers was prepared by the Statewide Planning Program staff to provide background information for the Committee.
5. The Committee and the University of Rhode Island jointly sponsored a workshop entitled Rhode Island Marine Resources: Problems and Opportunities for members of the General Assembly.

The Committee's findings and recommendations were presented to Governor Licht in March 1970. The 144 page report summarized the Committee's conclusions in five major areas: First, the activities and programs of governmental agencies in the Rhode Island coastal zone were reviewed.

This covered 25 federal, 8 regional, and 16 state agencies, and 7 activities of local government. Second, current and potential uses and users of the coastal zone were identified in 7 categories: recreation, conservation, and open space; waste disposal; military and naval; commercial fishing and tourism; transportation; research; and land use and development patterns. Third, problems and conflicts in the coastal zone were identified and dimensioned within 6 problem areas: pollution; management of resources; marine development; related development; conflicts between uses; and jurisdictional problems. Fourth, the need for a coastal zone management mechanism in Rhode Island was established and alternative methods of organizing a management agency were explored. Fifth, establishment of a Coastal Zone Council was recommended.

Legislation to implement the Committee recommendations was introduced into the Rhode Island General Assembly on March 3, 1970. The bill provided for creation of an 11-member Coastal Zone Council. Seven members would be appointed by the Governor, representing conservation, recreation, wildlife or aesthetic concerns; commercial fishing, business, industry or tourism; research and education; and local government. Four would be ex-officio members: the Directors of Natural Resources, Health, the Development Council, and Community Affairs. The Coastal Zone Council would be authorized to employ a staff and consultants to carry out its work.

The Council would be given several powers and duties. The most important of these would be:

1. To formulate and adopt a plan and resources management programs for the coastal zone.
2. To formulate proposed regulations and controls necessary to implement the coastal zone plan.
3. To implement the plan and administer regulations and controls following their approval by the General Assembly.

4. To charge fees for the use of state lands, waters, and resources.

5. To acquire property when necessary to carry out the plan.

The Committee also recommended that the statute setting the jurisdiction of the state over the territorial sea be amended to extend this jurisdiction to the maximum extent possible under the Submerged Lands Act of 1953, the Geneva Convention on the Territorial Sea and the Contiguous Zone of 1958, and relevant Supreme Court decisions.

An important feature of the proposed legislation was that it did not convey a blanket grant of authority to the Coastal Zone Council to prepare and implement a plan. Any plan could be implemented only after the plan and any regulations necessary to carry out the plan had been approved by the General Assembly at a subsequent session. The General Assembly could retain virtually continuous authority over the plan by giving its approval for a stated period of years, following which a new grant of implementing authority would be required. The only significant power that would be granted to the Coastal Zone Council prior to General Assembly approval of a plan would be that to charge fees for use of state owned land, waters, and resources. This is an immediate need, is essential when resources such as submerged sand and gravel deposits are being exploited for private purposes, and should not be dependent on an overall plan.

A public hearing was held on the bill by the joint House and Senate Finance Committees on April 23. There were many statements supporting the proposed legislation by the Audubon Society, a homeowner's association, a garden club, the League of Women Voters, a marina operator, and interested citizens. There were also many objections by groups such as the Rhode Island League of Cities and Towns, by individual local officials, and by private citizens. Most of the objections can be grouped into four categories:

1. Encroachment on local powers, and particularly on local zoning authority.
2. Encroachment on the local prerogative not to plan or control development, which is exercised by some key coastal municipalities.
3. Loss of personal liberty, ranging from a somewhat hysterical complaint that "This bill means that I'll have to get a permit from the state to move my rhubarb patch," to a more reasoned objection to the extension of governmental authority.
4. Need for more study of the problem. This was a very transparent attempt to delay consideration of the real issues, and is particularly objectionable in view of the many detailed and competent studies of Rhode Island's coastal zone already completed and the urgent need for action, not just study.

Some of the objections also descended to the personal level. I was described as "shortsighted and brainless" by one town councilman for urging adoption of the proposed legislation.

The hearing made it apparent that the bill faced strong opposition both within and outside the legislature, and passage during the 1970 session appears extremely unlikely. (Note: The House Finance Committee had not reported the bill at the time that the 1970 session of the General Assembly adjourned on May 2, 1970.)

Despite the probable failure of efforts to enact significant coastal zone management legislation in 1970, the Committee learned much and also accomplished a few things. The issue was brought to a head by the proposed legislation and the legislative hearing on it. Discussion was forced on issues that have been avoided for years, if not for decades. Much was learned through the Committee's contacts with those concerned about the coastal zone.



The kind of opposition encountered was expected, but we did not anticipate the extent or depth of this opposition. It became obvious that careful groundwork must be laid by explaining and promoting the concept of coastal zone management before this kind of effort can succeed. Despite opposition and the obstacles encountered, the effort was worth making, and should contribute to a more successful approach in the next session of the General Assembly.

VERMONT'S ENVIRONMENTAL LAWS: A COMMENTARY ON  
ENVIRONMENTAL MEASURES ENACTED BY THE 1970 GENERAL ASSEMBLY

Bernard D. Johnson  
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Vermont Planning and Community Services Agency  
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I have been asked the following question many times in the last few months: "How is it that Vermont has been able to pass such strong environmental legislation?" The fact that five major environmental bills were passed the first time they were introduced is a source of amazement to many friends and colleagues in the field. This legislation gives Vermont extraordinary authority to seek and achieve environmental quality in the face of an environmental crisis. The new legislation gives Vermont the means to move from talk to action in mounting an effort to overcome our environmental problems. This legislative package offers several pioneering concepts in environmental planning and management. Quite possibly, our new laws will offer model legislative proposals for consideration by other states.

To the typical resident in the northeast part of our country, Vermont is thought of as a rural state that has more cows than people; has picturesque villages; is predominantly agricultural; and offers plenty of clean water and fresh air. A recent survey by the Vermont Development Department, taken to determine why people come to Vermont and what they look for, revealed that people are attracted to Vermont because of this rural character and so-called untouched quality. It has been said that Vermont's relatively low level of economic development and inaccessibility has been responsible for preserving a way of life and quality environment that has disappeared from most areas of our country within the past several decades. However, the past few years have produced rapid change in Vermont.

The 1960's brought unprecedented growth to Vermont. No longer can it be said that Vermont is inaccessible. The Interstate highway system has linked Vermont with the major population areas along the Eastern Seaboard and to the north along the St. Lawrence Valley. The rapidly growing population in these areas increasingly has looked to Vermont for recreational opportunities. This has created tremendous pressures upon rural land, lakes, streams, and the mountains in Vermont. The 1960's in Vermont were also characterized by rapid and substantial economic development. Many new industries locating in Vermont were often attracted because Vermont was relatively free from congestion, smoke, noise, and other typical metropolitan ills.

Vermont's increasing accessibilities and rapid economic development have produced benefits but have also produced many problems. Growth has brought demands for new schools, water and sewer facilities, housing, and new roads. The demand for land by out-of-staters has produced an inflated land market often to the detriment of the Vermonter seeking land for housing. Land values in Vermont are appreciating at an annual rate of 33 percent. Real estate taxes have become a burden for many citizens as local selectmen seek revenues to pay for the increasing costs of providing services to a growing population. Small Vermont towns, once basically agricultural, are witnessing rapid and often uncontrolled changes. Dozens of large recreational developments are now actively underway or have been proposed. This is particularly true in southern Vermont. In a typical southern Vermont town, the board of selectmen and planning commission are overwhelmed by the magnitude of these proposals. They have neither the resources nor the technical know-how to deal with such proposals, and regrettably have not enacted zoning or subdivision regulations for the evaluation and approval/disapproval of large scale land development. These new developments appear to be pushing the limits of our environment beyond tolerable limits.

Land development in Vermont has been in a virtual state of anarchy. Almost every area in Vermont has been vulnerable to land speculation--but land development controls were largely absent. In the spring of 1969, Governor Davis appointed an Environmental Control Commission. The Commission was charged with developing a legislative program and establishing some badly needed ground rules for protecting Vermont's environment.

Concern over inadequacies in water supply systems and sewage disposal systems produced some immediate action by state government. In September 1969, the State Board of Health adopted tough new rules and regulations that established minimum standards for sewage disposal systems in connection with the subdivision of land. The enactment of these new rules and regulations was a positive first step by state government to set minimum statewide standards for land development.

This legislative session was dominated by two major concerns: the environment and government reorganization. As I indicated earlier, virtually all major environmental bills were enacted into law. Nearly one-half of Governor Davis' reorganization package was adopted by the legislature. A basic concept involved in reorganization was the establishment of a cabinet system of government. One of the major "super" agencies created through reorganization is the Agency of Environmental Conservation. It is hoped that this new agency, which combines virtually all of the natural resource agencies and boards in state government, will significantly enhance the state's ability to effectively plan and manage its environment. This new agency combines the Departments of Forests and Parks; Fish and Game; Water Resources; Interagency Committee on Natural Resources; and creates a Protection Division that will combine the administration of several land development rules and regulations.

There were five major environmental laws enacted this past spring.

They are as follows:

Act No. 250. This act created an environmental board and district commission. This act provides authority to develop a statewide land capability and development plan and establishes an environmental board for the purpose of regulating land development. The administration of the state board's rules and regulations covering land development will be handled by nine district commissions.

Act No. 252. This law concerns water pollution control. The principal feature of this measure is that it requires temporary pollution permits for those individuals or firms which now, and after a certain date, will be polluting the waters of Vermont. It also provides a fee schedule for temporary pollution permits which will offer an incentive to abate the causes of pollution.

Act No. 229. The basic purpose of this law is to encourage the continuation of open land in Vermont through the acquisition of rights and interests in land. The law authorizes certain state agencies and Vermont municipalities to acquire development rights from property owners.

Act No. 291. This act establishes statewide controls for the development of mobile home parks.

Act No. 281. The purposes of this law are twofold: (1) to provide a state plan and policy regarding the development of water impoundments, and (2) to provide for the zoning of shorelands in Vermont. The law provides that municipalities may develop zoning by-laws for shorelands from a point up to 1,000 feet inland from the mean water mark. If a municipality does not exercise this authority to zone shorelands by June 1, 1972, then such regulations will be written and adopted by the State Department of Water Resources.

The Vermont legislature has adopted tough, yet realistic, measures to deal with our environmental problems. How did this come about? I think we have got to remember that in the past the Vermont legislature has adopted stringent statewide controls. The best recent example, of course, is our state billboard law adopted in 1968. As some of you are aware, this law basically prohibits off-premise outdoor advertising signs and billboards in Vermont. The billboards and signs are to be taken down and will be replaced by a statewide system of information services.

In many respects Vermonters have made the choice for environmental quality. Regional planning commissions, the League of Women Voters, Garden Clubs, Conservation Organizations, and other groups and individuals have long called for this kind of legislative program. Regional planning commissions have been particularly active, calling attention to our environmental problems, and providing a channel for communicating this concern to the general public as well as to our General Assembly. Their efforts have been greatly aided by the press which has consistently backed public efforts to meet our environmental problems. The press contributed to a massive effort of public education involving governmental and private organizations.

The challenge now facing Vermont state government, and indeed all Vermonters, is the implementation of the far-reaching legislative authority granted for the purpose of guiding land development. Much work lies ahead in organizing and reorganizing elements of state government to put our environmental house in order. New rules and regulations must be drafted and tested to implement our pioneering environmental concepts. Many citizens will be asked to devote long hours toward serving on boards and commissions that have been created to administer the new legislation.

The coming year is critical for Vermont. The next twelve months will demonstrate whether the state can effectively plan, manage, and ultimately, protect and preserve its environment.

## COASTAL ZONE PLANNING IN CONNECTICUT

Horace H. Brown, Director  
Office of State Planning  
Connecticut Department of Finance and Control  
Hartford, Connecticut

Connecticut's coastal resources consist of Long Island Sound (jurisdiction of which is shared with New York State) and 253 miles of irregular shoreline located in 24 towns. Our coast encompasses many small bays, inlets, estuaries, harbors, and beaches. The three major estuaries are formed by the Housatonic River, Connecticut River and Thames River. There are about 14,000 acres of tidal wetlands remaining in the State compared to a total of 26,000 acres in 1914. The State presently owns 4,000 acres of tidal marshes.

Long Island Sound is a major recreation resource for the people of Connecticut. There are about nine miles of the Connecticut shoreline that are publicly-owned beaches, including six shoreline parks.

There are more than 100,000 boats in Connecticut; two-thirds of all boating use in the State is estimated to take place on Long Island Sound. Fishing, swimming, hunting, and other forms of recreation are indulged in extensively in and along the Sound.

Commercial fin-fishing is carried on in the Sound to a modest degree in comparison with our sister coastal states. Lobster fishing and shell fisheries produce substantial yields, with oysters as one specialty. Commercial fishing on Long Island Sound, however, is not of the scale it was in past years.

Major problems confronting Connecticut in the area of coastal management are (1) preservation of the best of our remaining tidal wetlands; (2) elimination of water pollution as a serious problem in Long Island Sound and our estuaries; (3) preservation of the natural beauty and the quality of the shoreline environment; (4) regulation of dredging, and other extractive industrial operations in and under tidal waters; (5) provision for and management of adequate recreational uses of the coastal area; and (6) research, development, management, and regulation programs to improve the status and production in the area of marine fisheries. We turn now to a detailed discussion of each of these problem areas.

#### Tidal Wetlands

As we have noted, there are some 14,000 acres of tidal wetlands in Connecticut's coastal and estuarine regions today. The State owns 4,500 acres of these wetlands; they are under the jurisdiction of the State Board of Fisheries and Game. It is the considered judgment of the State, as reflected in a firm policy statement, that acquisition is the best means of protecting the best of our remaining tidal wetlands. The goal is acquisition of about 7,000 acres, in addition to those already held by the State, within the present decade. This would leave about 2,500 acres to be acquired by municipalities, private land trusts, or to continue to be held by private individuals.

Connecticut also has a wetlands protection law (Public Act 695 of the 1969 Legislature). Under the provisions of this statute, the Department of Agriculture and Natural Resources is preparing an inventory of all tidal wetlands as defined in the law, mapping these areas, holding public hearings on each section and finally designating them as tidal wetlands in accordance with the Act.



Following completion of these steps, it will be necessary to secure a permit to conduct regulated activities, including dredging, filling, draining, excavation, erection of structures and similar uses on established wetlands in Connecticut. We are hopeful that Public Act 695 will supplement our acquisition program for the preservation of tidal marshes until the best of these areas can be acquired by the State and other governmental and private interests.

#### Water Pollution Control

Connecticut is well underway with a determined effort to clean up virtually all of its 8,400 miles of streams and rivers and its 6,000 lakes and ponds by December 31, 1974. Backed up by a strong law (Public Act 57 of the 1967 Legislature), \$250 million in grant funds to assist municipalities with the construction of sewage treatment facilities, and tax advantages to industries which cooperate in developing adequate waste treatment facilities, Connecticut will, without qualification, reach its goal by December 31, 1974, if not considerably earlier, according to the Connecticut Department of Agriculture and Natural Resources.

Our Clean Water Program will be a major factor in reversing the trend toward increased pollution of Long Island Sound. Supplemented by an Oil Pollution Control Law (P.A. 765, 1969 Session), considerable progress is expected in improving the quality of our tidal waters in the months and years immediately ahead.

#### Preservation of the Shoreline Environment

Protection and enhancement of the natural qualities of the coastal area is part of a statewide program to preserve Connecticut's open spaces. As stated in The Green Land, a report of the Connecticut Interregional Planning Program, "The chief goal is to achieve a permanent balance between man and his natural environment that will yield him the most benefits."

At the Local level all 24 shoreline towns have Planning and Zoning Commissions and 17 of these have established Conservation Commissions. Strong interest in the protection and management of water and land in the area of marine influence has been evidenced by the production of natural resource inventories, administration of planning and zoning ordinances regulating development, and special committees for wetland protection, beach erosion control and restoration, and, in some instances, regulation of shell fisheries.

All of the shoreline and estuary areas are covered by 5 of 15 planning regions in Connecticut. While they represent different stages of development, each planning region that includes towns bordering tidal waters has prepared work that exhibits strong purpose in the protection and compatible development of marine areas.

At the State level the Department of Agriculture and Natural Resources and the Office of State Planning are the principal agencies concerned with planning for and management of the shoreline land and water areas. The Connecticut Interregional Planning Program Report previously cited and the Statewide Comprehensive Outdoor Recreation plan stressed the need for developing and executing rigorous plans for protection of the natural resources in the shoreline environment including landscape preservation, development of additional State park facilities, and the establishment of historic districts.

The Department of Agriculture and Natural Resources administers several programs that affect the coastal areas. Through the Open Spaces Program, authorized in 1963, additional land for State parks, boating access, hunting, and fishing have been acquired. Grants have also been made to shoreline towns to help purchase land and water for conservation and outdoor recreation. In addition, the State Water Resources Commission administers an extensive beach erosion control program that has carried out or initiated about 80 restoration projects at a State cost of more than \$7.5 million over the past 15 years.

The Connecticut River National Recreation Area (CRNRA) proposal which is now before the Congress for consideration, authorization, and funding includes a section in the estuary region of the Connecticut River which is called the Gateway Unit. If adopted and implemented in accordance with the plan, this part of the CRNRA will be an important step toward preservation of the shore and estuary environment in this area.

Regulation of Dredging and Extractive Operations in Tidal Waters

The State Water Resources Commission and a representative of the State Shell Fish Commission regulates the taking and removal of sand, gravel, and other materials from lands under tidal and coastal waters. The Commission is charged to make its decisions "with due regard for the prevention or alleviation of shore erosion; the protection of necessary shell fish grounds and fin fish habitats; the preservation of necessary wildlife habitats; the development of adjoining uplands; the rights of riparian property owners; the creation and improvement of channels and boat basins; the improvement of coastal and inland navigation for all vessels, including small craft for recreational purposes; and the improvement, protection, and development of uplands bordering upon tidal and coastal waters, with due regard for the rights and interests of all persons concerned." (Sec. 25-10 General Statutes). A permit from the Commission is required to remove sand, gravel, or other materials lying below the mean high water mark of tidal or coastal waters with a provision for payment for the value of such materials to the State when disposed of for commercial purposes (Sec. 25-11 General Statutes).

Except for the provisions cited above, Connecticut statutes are silent as to regulation of extractive industries proposing to explore or take minerals or other materials from the land beneath Connecticut's tidal waters.

### Recreation Uses

Much of the information provided under the section on Preservation of the Shoreline Environment is applicable to the subject of recreational uses. In addition, it should be noted that much of the recreation demand is water-based with almost one-half of the activity in saltwater areas. The projected doubling of Connecticut's 1960 population of 2.5 million by the year 2000, and an anticipated increase in the rate of recreation use per capita indicates that recreation facilities in the coastal area must be developed at an increasing rate to keep up with rapidly growing demand. Analysis points up the need for facilities at State parks to accommodate to 90,000 instant capacity. There have been two new State parks acquired in recent years: Silver Sands at Milford and Bluff Point in Groton. Silver Sands is presently being developed and should be opened for limited use in about two years. Bluff Point State Park will be developed somewhat later as increasing demand requires these additional facilities.

Swimming, boating, camping and other activities in the shore areas will also increase proportionately over the next three decades and accommodations for these must also be provided in order to satisfy the need for these forms of recreation.

Acquisition of additional land including access areas to reach the water will have a high priority in the years immediately ahead. Plans for development of recreation facilities will receive proportionately less attention in the immediate future, but will increase in five to ten years to reach dominant status as acquisition goals are realized and demand for construction of facilities increases.

### Research and Development in Marine Fisheries

Research activities in the marine area have been increasing in Connecticut, as in the other New England coastal states. Among the efforts presently under way in this area are the programs carried out by the Marine Fisheries Division of the Connecticut Board of Fisheries and Game, and the Marine Research Laboratory at the University of Connecticut. The Legislature at its 1969 Session (P.A. 721) created a Marine Resources Council consisting of representatives of the Board of Fisheries and Game; State Shell Fish Commission; the Shell fish industry; natural growth oystermen; marine sport fishing interests; commercial fin fishing industry; and a conservation commission member from a coastal town. The Council has been charged to study the marine resources of the State and to make recommendations for executive and legislative action to the Governor.

One of the prime goals of the marine research presently under way is improvement of the status and production of marine fisheries. It will require considerable effort merely to maintain commercial fisheries operating out of Connecticut and a great deal more work to increase the size of this industry. We believe, however, that with alleviation of the pollution problem, protection of our tidal wetlands and offshore shell fish beds, and with the aid of applied research and perhaps other forms of governmental assistance, this once important industry can hold its own and even move ahead.

Recreational fisheries, of course, have much the same requirements as do commercial fisheries and will generally tend to improve or to decline as the environment for marine life improves or worsens, since the same factors affect fish whether they are sought for profit or for enjoyment.

Adequate access points and other boating facilities are required for the sports fisherman, however, while satisfactory docking and processing facilities are needed for the commercial fisheries.

#### Summary

We have presented a brief outline of the steps that Connecticut has taken and is taking to protect and develop its marine and coastal area land resources. In presenting this background, we hope that you will not draw the inference that we are at all satisfied with the results that we have achieved to date. Nor do we mean to imply that we either think that we can or that we desire to go it alone, so to speak, in managing our coastal resources.

We are deeply cognizant of the interrelations among many jurisdictions with respect to any part of the marine environment: local, state, regional, national, and international. We welcome the opportunity to work with our sister New England States in this area of growing importance. We would like to learn from the research and development activities of the other states in the region and we want to contribute to the general body of knowledge that will be accumulated in the process.

We hope, also, that we will be able to participate in regional decisions, projects, and joint regulatory efforts to develop our coastal resources to the ultimate level, commensurate with maintenance of a sound ecological balance in the process.

We welcome, too, the chance to work with Federal agencies in this area. The vast resources of the Federal Government will be needed to undertake marine and coastal management projects at the scale required for success in these efforts.

## ESTUARINE AND COASTAL MANAGEMENT IN MASSACHUSETTS

Frank Grice, Director  
Division of Marine Fisheries  
Massachusetts Department of Natural Resources  
Boston, Massachusetts

The Commonwealth of Massachusetts has carried on a comprehensive program designed to inventory, categorize, protect, develop and manage estuarine and coastal areas with the widest beneficial use of land, water, and living resources. These activities, through the Department of Natural Resources, were initiated in 1963 and represent large expenditures of manpower and funds over seven years of operation. Our Division of Marine Fisheries estuarine research and inventory projects alone have amounted to over 60 man-years of effort with an expenditure of approximately \$700,000. The administration of management programs, coastal wetlands protection, and restrictive devices have required another 12 man-years and about \$250,000.

The establishment of an estuaries and coastal management program in the Commonwealth did not occur by chance. As long as 15 years ago, and certainly by the early 1960's, great concern was expressed over the rapid deterioration of our estuaries and coastal wetlands. Before such concern arose, the public considered wetlands (usually called marshes) as wastelands: a no-man's-land that could be despoiled or altered to fit the demands of a mushrooming and highly technological society. By 1961 it had been demonstrated that these areas do, in fact, rank above most agricultural land in their productivity and that this productivity is not lost but has indirect and direct beneficial effects on mankind. To circumvent environmental destruction, Massachusetts established programs by 1963 for the evaluation, protection, and enhancement of its estuaries and its coastal zone.

Since their inception, our projects have expanded and have moved forward in comprehensive fashion to provide protection for the areas of concern; to establish priorities and economic values; and to define maximum beneficial use. During the current period of management, 15 coastal bays and estuaries have been studied. Resource values have been established and effective legislation has been provided--legislation that curtails destructive alterations of coastal wetlands while providing for orderly development of beneficial uses. Investigations had established that the Commonwealth's 60,000 acres of coastal wetlands were of high or moderately high value for shell fish and finfish; for waterfowl and fur bearers; for hunting and fishing; as well as being of historic and scenic value. Considerable acreage had been lost to indiscriminate alteration. Now, however, the Commonwealth's wetland protective devices have curbed this movement and have provided a great measure of management practice. For example, since 1965 with public support and approval (through community hearings) 11 areas comprising about 13,500 acres can now be managed for their best use. This is one-fourth of the Commonwealth's coastal wetlands area.

Coastal fisheries now stand on the threshold of a new era: the day of the hunter is passing, the day of the farmer is approaching. We can no longer depend on the sometimes inefficient, inexact production of nature to supply our needs from the sea. In order to produce the specific products our society demands, we must plant, cultivate, and harvest just as we have done on the land.



One of the very necessary prerequisites for this aquaculture will be the ability of the sea farmer to control the harvest from the area being cultivated. No farmer on the land could allow unrestricted public use of his crops; neither can the aquaculturist. Yet in most of our coastal areas private grants to farm the sea are unobtainable or severely restricted. Traditionally, this has been public domain, and as pressures from recreational and other developmental interests increase, the opportunity to set aside areas for commercial sea farms becomes even smaller.

I believe the answer lies in zoning our coastal areas, but not as we have zoned the land, because much of that has been wrong. We need to consider all uses, all values, and then develop a master plan that incorporates these factors. Without such a plan, increasing pressures will create chaos and our coastal areas will never produce the resources of which they are capable.

## REGIONAL CONSIDERATIONS IN COASTAL DEVELOPMENT

Stewart Lamprey  
Federal Co-Chairman  
New England Regional Commission  
Boston, Massachusetts

As many of you may already know, the New England Regional Commission's fundamental purpose is to strengthen the economic system of New England. Therefore, I would like to begin by stating a regional view of the coastline as an economic resource. There are two important dimensions to this view: economic activities themselves, and the shore as a factor in New England's competitive position compared to other areas of this country.

Historically, the sea has been the source of livelihood for New Englanders for 300 years; and commercial fishing and shellfish industries still represent an important means of economic life to many of our smaller coastal towns. Looking to the future, we can see the still undefined opportunities in the emerging field of aquaculture. Further, we are aware of the vast potential economic assets as well as the environmental hazards represented by offshore oil deposits.

Beyond the more tangible economic worth of the coastline, the Commission sees that the environment is an important long-term economic asset in its own right. The region's sense of history, its mountains, forests, and shore represent a major source of economic vitality for all New England and particularly for those outlying areas that are still beyond the commuting range of metropolitan areas. Not only does tourism contribute a substantial amount of money to the economy, but the Commission suspects that regional assets such as the shoreline are a major factor in attracting and keeping the high technology and "export service" industries that New England's economic future depends upon.

Having established the Regional Commission's vital interest in the coastline, let us examine what is happening. The coastal zone of New England represents perhaps the most crucial area in which the region's developmental and environmental conflicts must be resolved. The coastal zone of the Atlantic and Pacific Ocean is receiving an increasing amount of concern at the Federal, Regional, and State levels. In New England, three major issues are emerging

First, the issue of population density. Massive numbers of people utilize the coastline for homes, recreation, food, jobs and the necessary supporting facilities such as power plants and sewage treatment plants. New England has a very high concentration of population (166 persons per square mile); most of these people live along the shore. Half of the population is within 20 miles of the Atlantic shore; more than 80 percent are within an hour's drive of the coast. Projections of population and employment to 1980 indicate a continuation of this trend. With regard to employment, 88 percent of the new jobs are expected to concentrate in the heavily urbanized corridor running parallel to the shore from New York through Boston to Portland, Maine. In addition to the demands of permanent residents for housing, industry, and recreation space, burgeoning tourism and seasonal home industry creates its own set of pressures on land and the environment. In Maine, for example, many towns report a summer population which is more than twice the number of year 'round residents. As a Maine official recently stated, "We're only a day's drive from 50 million people."

Second, we are running out of shoreline. A recent survey estimated about half of the nation's shoreline is amenable to recreation and human habitation. The survey found that only 5 percent of the total usable shore is now protected for use of the public. Virtually all of the remaining shore has been preempted for the private use of corporations or individuals. Millions of the nation's less privileged citizens are close to losing all access to the sea.

Third, there are conflicting uses. Many of the uses of the coastline are not compatible. We are becoming increasingly aware that man's utilization of land and the shallow waters of the coastline can have devastating effects upon the fragile ecology of the air, land, and sea life. Careful programs of land and water management are required to save and reclaim the sea.

Summing it up, we can no longer assume that man can continue to extend his domain over the coastline without incurring severe social and environmental costs. The remarkable asset of the shore can be lost, and with it, many of the things that contribute to unique New England ways of life.

Although the causes of our present concern are many and complex, it is useful to identify two in particular: lack of coordination among conflicting demands, and lack of knowledge.

New England has a historic pattern of individual decision-makers taking isolated actions to further their individual ends, most of which were individually logical. As long as the coastline was viewed as an inexhaustible resource to be exploited, individuals and government agencies operated in isolation from any larger community concerns. Over the years, conservation and economic development interests viewed each other with attitudes ranging from suspicion to downright hostility. There were several reasons for such conflicts:

- (1) Actions by some economic developers reflecting a 19th Century spirit of land exploitation that has been sufficient to cause legitimate concern by persons with conservation interests regarding all economic development proposals.

- (2) Flat opposition to urbanization and economic development on part of some conservation groups which failed to recognize legitimate development pressures and the positive contribution of the sea to jobs and urban settings.

(3) Each side of such conflicts has tended to make the simplifying assumption that the opposition has a completely monolithic point of view. In fact, there are internal stresses and competition within both economic development forces and conservation organizations.

(4) Citizen participation, which has frequently been limited to public hearings, has been called only after decisions had already been made.

A second cause of our problems is the lack of knowledge concerning many of the more subtle effects of man upon his environment; and even more distressing, how to correct the situation. As was recently pointed out at a series of panels on ecological planning in New York, science doesn't yet have the knowledge necessary to confidently predict the best ways to reclaim our threatened environment. The urgency of the situation requires that the available knowledge be translated into action programs now, but at the same time, a commitment to much more research will be required.

Let us now turn to the actions required to meet the pressing and conflicting demands on the New England coastline. Three difficult conditions will have to be met:

(1) A coordinated and explicit governmental policy is needed that views the coastal zone as a valuable entity in its own right.

(2) Formulation of coastal zone policies and development standards should be undertaken with consideration of all legitimate points of view. Consideration of both conservation and economic development interests will be required in order to find those areas where development is appropriate with effective controls, and those areas where man must be excluded.

(3) Some continuing government policy toward the coastal zone is required. Informal and ad hoc committees may be used to get actions moving, but they will not ensure long-term control of the coastline.

If these are the prime conditions for establishing the regional concern of the public in coastal development, I am pleased to report some very encouraging resources are available and new actions are underway.

In programs dealing with the coastline and other water-related issues, the Regional Commission works closely with and supports the efforts of the New England River Basins Commission. The River Basins Commission, which includes agencies involved with water and conservation programs at both the Federal and State level, is concerned with effective water management programs in all of New England, particularly including the shoreline. That Commission combines the advantages of a broad river basin approach to water management with a multi-state base for its planning and programs.

The River Basins Commission is currently initiating the Southeastern New England program focusing on the area that includes Boston through Narragansett Bay. I am sure I need not elaborate, as this program represents a part of a coordinated Federal-State program under the leadership of the Water Resources Council, and will provide an opportunity for a well organized examination of the demands and the problems of the southern part of the region's coastal zone.

Another important step toward realization of the goal of assuring that there is an explicit Governmental Coastal Policy has been initiated by the State of Maine utilizing Regional Commission and HUD funds.

I assume that this project is, or will be, well known to the participants of this meeting. The Commission hopes that in the future it will be able to expand its support to the States in other projects related to the objective of coastal management. The first steps of the SENE and Maine studies hopefully represent a beginning, and will serve to create the overall framework in which the many individual issues and conflicts may be effectively resolved so that the shoreline may remain a valuable regional equity serving all New England's people.

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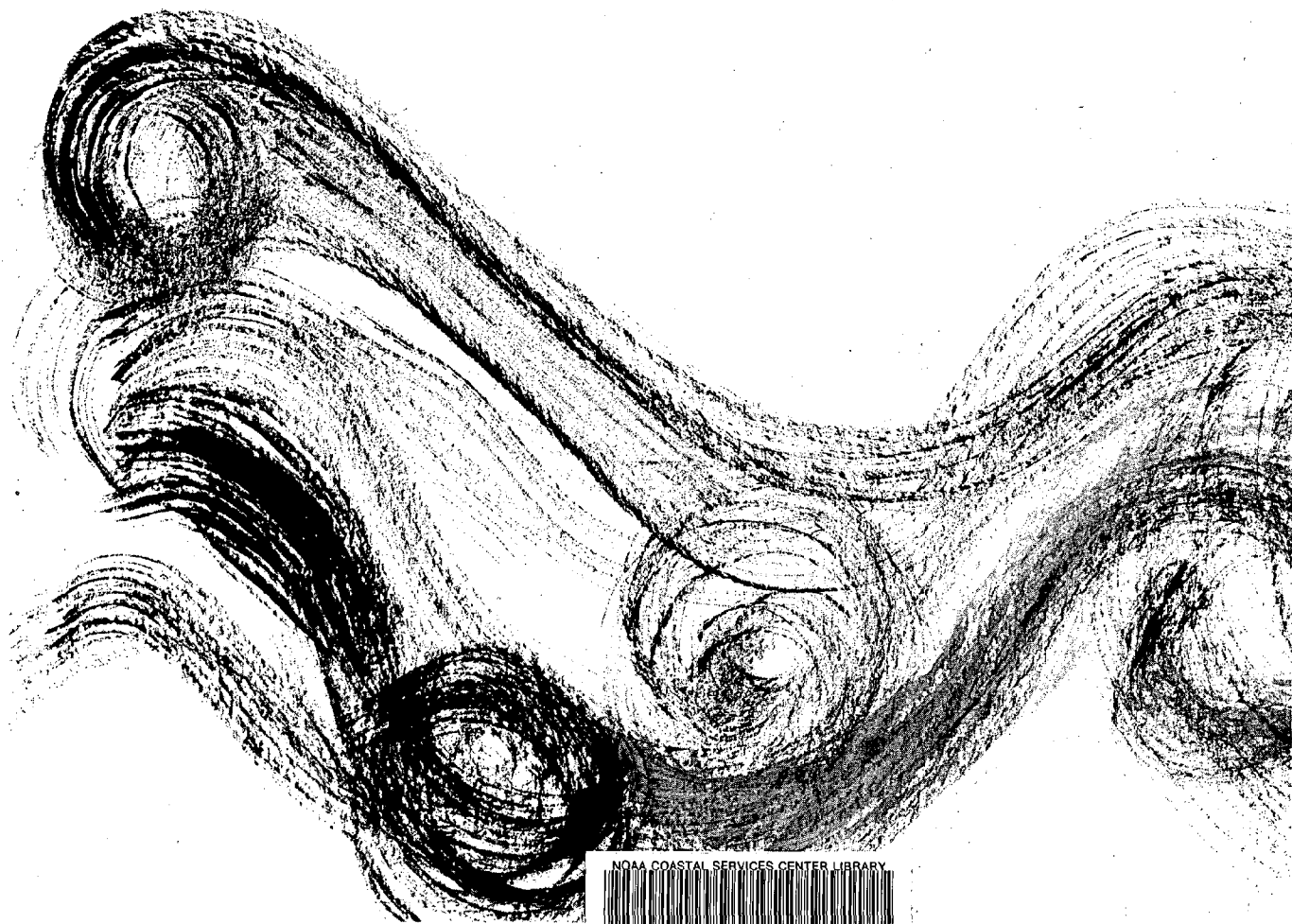
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Support has been provided by the National Science  
Foundation, Office of Sea Grant College Programs



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